

Piloting Knowledge Swaraj: A hand book on Indian Science and Technology



Edited by

C. Shambu Prasad

Xavier Institute of Management Bhubaneswar

scienceswaraj@gmail.com

For

Knowledge In Civil Society (KICS) - Centre for World Solidarity



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Piloting Knowledge Swaraj in India: A Handbook on Science and Technology in India

1. Introduction

The Handbook on Indian science and technology is the result of the three-year project “Science, Ethics and Technological Responsibility in Developing and Emerging Countries” (hereafter SET DEV), which was undertaken in order to support the research systems and to encourage a socialization of scientific and technological research in India and Kenya. The projects aims include activating processes of building institutional capacities and skills on science, ethics and STR socialization and defining and understanding perspectives of socialization of science and technology that take into consideration local needs in a multilateral dialogue. The project involves 11 partners in India, Kenya and Europe (www.set-dev.eu) and the this report, an output of the work in India, has been coordinated by the Centre for World Solidarity (CWS) with a network on science and technology promoted by it – Knowledge in Civil Society (KICS) in collaboration with the University of Hyderabad and the University of Maastricht.

The Indian handbook is an extension of the work on the Indian manifesto – *Knowledge Swaraj* and seeks to extend the idea of the manifesto (<http://kicsforum.net/kics/kicsmatters/Knowledge-swaraj-an-Indian-S&T-manifesto.pdf>) through case studies in different domains. In this introductory chapter we describe. This document first highlights the methodology of engagement by the SET DEV partners and the processes followed in selecting the case studies. We then explain some of the insights from three of the pilots on the explication of the ideas of the manifesto. In the subsequent chapters the three case studies – medical ethics in hysterectomy, sustainable built environment in reconstruction and democratising the water sector are presented. We conclude by providing some insights on the socialisation of science in India drawing upon the experiences of the case studies and two focus group discussions and a consultative workshop that were held between Jan – March 2010 at Hyderabad and Bengaluru. The handbook on Indian science and technology takes further the ideas on socialisation of science and technological responsibility by suggesting that there is an important role for civil society organisations in India in the process of socialisation of science many of whom have

been involved in larger discussions on issues relating to knowledge and democracy. In this handbook we use the interrelated phrases and words 'case studies' and 'pilots'. The individual case studies were not meant to be academic in nature or stand-alone pieces but part of the process of the Indian manifesto and broader processes of socialisation of science and linking knowledge and democracy in India. We use the pilots to refer to this larger process and the case studies to refer to the specific cases.

1.1 Methodology of the Pilots

The work on the pilots began with a one day workshop in March 18th 2009 at Hyderabad to first discuss the manifesto and its key ideas and the plan for the pilots. The workshop had the participation of members from University of Hyderabad (UoH), Centre for World Solidarity (CWS), University of Maastricht (UoM) and the network of Knowledge in Civil Society (KICS) with an equal mix of people who were directly involved in the drafting of the manifesto at a workshop in Tejgadh, Gujarat in November 2009 and those who were likely to be part of the pilots and were not able to participate in the manifesto process.

During the workshop Prof Wiebe Bijker had outlined the processes for the development of the Handbook captured in Figure 1.1 showing how the manifesto needs to engage with different groups of stakeholders. The workshop had sub-groups to look into how the manifesto could be taken to these different stakeholders. It was decided that the investigation of practices will focus on the work of civil society organisations as proxies for peoples knowledge given the importance given in the manifesto about Knowledge Swaraj and the need to strengthen the relations between knowledge and democracy.

The workshop also took forward some comments on the manifesto with the constitution of an editorial team comprising of Wiebe Bijker, Shambu Prasad, Prajit Basu, Haribabu and Shiv Visvanathan. Chapters of the manifesto were ready for broader discussion by May 2009 in time for the steering committee meeting at Nairobi. During the deliberations at Nairobi the Indian partners discussed the plan for the case studies and the handbook. Given the prominent role foreseen of civil society organisations in the Indian manifesto it was agreed that CWS would take forward the pilot studies through the network of KICS.

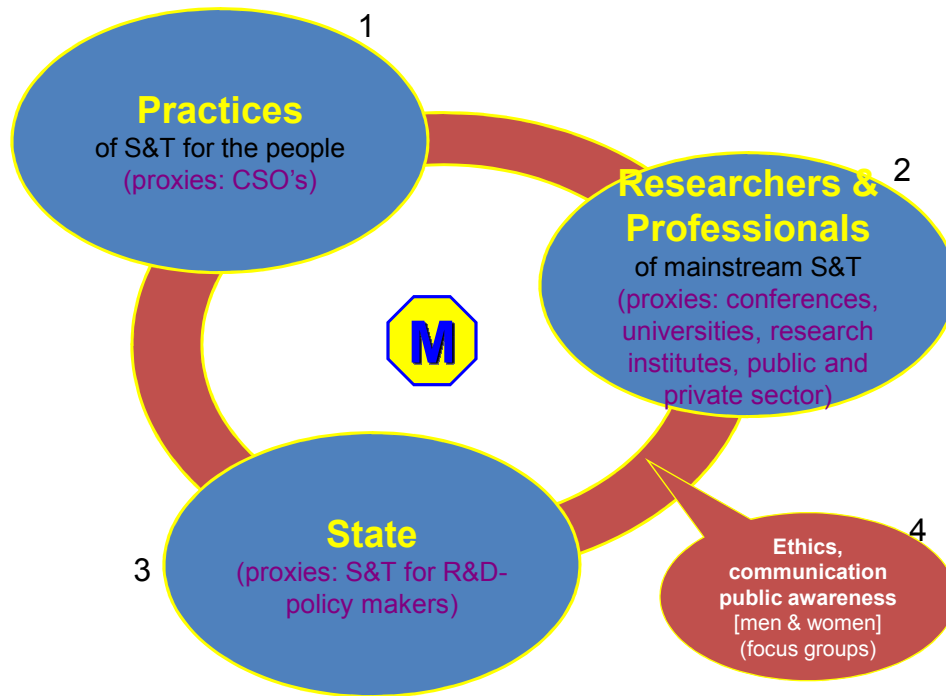


Fig1.1 Conceptual Map linking the manifesto with the pilots and focus group discussions

Even as the manifesto was getting finalised for its public launch the process for selection of the case studies was initiated with a call for concept notes shared widely with the various civil society organisations who were aware of and/or part of the manifesto process. A case advisory team of Haribabu, Wiebe Bijker, Rama Melkote and Shambu Prasad was constituted to review the concept notes and provide suggestions for developing them into full fledged proposals. A total of seven proposals were received on diverse themes and sectors that included health (medical ethics), climate change, water, sustainable built environment in reconstruction, sustainable agriculture, energy and handlooms.

A day long workshop was held on June 27th with all the case study leaders where their concept notes were presented and discussed. While the SET DEV requirement was for the handbook was for only two case studies during the workshops it was felt that given the richness of practices and expertise available in diverse sectors the attempt should be to go along with as many as would be feasible given the constraints of time and financial resources. There were a total of seven ideas and themes from which five were chosen and three of which have been selected for presentation in the Handbook. Some of the other ideas have had a different kind of

engagement in the form of focus group discussions and consultative workshops and they have been provided as part of the lessons and conclusions in Chapter 5. Three of the cases (medical ethics, water and the consultative workshop and case study on sustainable agriculture) had a focus on practices in Andhra Pradesh while the other two (reconstruction and the focus group on climate change) were more broadly situated within the debates in India.

The case study leaders were encouraged to form teams that included the key actors from the civil society organisations – Drs Kameswari and Prakash of the Life HRG (medical ethics in hysterectomy case), Radha Kunke from Architecture & Development (Sustainable built environment in reconstruction), M V Ramachandrudu from Watershed Support Services and Activities Network (WASSAN) (democratising water sector). The teams involved other organisations in some cases and were encouraged to involve social science expertise to enable thinking of the ideas from the field in the lines of the manifesto. Some of the members of the case advisory team also actively participated in the conceptualisation of the cases and commenting on draft versions.

To enable collective reflections a separate googlegroup of the case study leaders, their teams and the case advisory teams was constituted. The case study leaders presented the findings of their work at a workshop on the 17th and 18th of November, 2009 at Hyderabad and the broad project framework of socialisation of science and technological responsibility were technological responsibility were discussed and the case teams encouraged to finalise their proposals based on the comments and suggestions from the workshop. The case studies were encouraged to look at the connections between their practices and the manifesto and were further strengthened by the availability of the printed version of the draft manifesto and the holding of consultative workshops in January 9th (medical ethics focus group discussion), February 24th (focus group on climate change) and March 9-10 (consultative workshop on 'Mainstreaming of ecological approaches in agriculture – issues and opportunities').

The reports of the focus group discussions and consultative workshops have been synthesised as lessons in Chapter 5. These workshops were big events, well attended and had important contributions from research institutes often taking up questions on knowledge hierarchy, the role of the experts and ideas of the manifesto with the civil society organisations that were leading the case studies. They were good examples of socialisation of science and provided insights on the context of scientific research and how the case studies could (or could not as the case might be) engage scientists and researchers on issues of science and ethics.

The reports were finalised following the workshops and were ready for presentation at the third steering committee that was to be held at Hyderabad in April that however had to be cancelled due to the volcanic ash eruption in Europe that led to cancellation of flights internationally. The final workshop of the case study leaders however proceeded as planned at the workshop on April 19th 2010. This had the participation of SET DEV partners Burkhard and Hinano even as Wiebe Bijker a member of the case advisory team could not make it. Kavitha Kuruganti, a KICS member was invited to the workshop and help with the editing of the case studies and join the case advisory team. The three case studies attached have since been through a few rounds of discussions back and forth between Kavitha, Shambu and the case study leaders.

1.2 Piloting Knowledge Swaraj

The key ideas of the manifesto related to the triad of justice, sustainability and plurality as elements that need to guide and inform science and technology policies in future. The happy coincidence of the manifesto process that included reflecting on *Hind Swaraj* – Gandhi's document or manifesto for Home Rule written in 1909 – with the ongoing centenary of Hind Swaraj was something that many case study leaders could relate to. Thus even though the language of the manifesto of Knowledge Swaraj was more academic with a strong social science bias efforts were made to broaden the ideas so that the case study leaders could find their own points of entry and emphasis in relation to the manifesto. The concept notes and proposals were meant to highlight one or more aspects of the manifesto process. This has been an iterative and dynamic process with substantial revision and fine tuning of the ideas with every revision of the case study.

We present below some preliminary findings of the links between the case studies or pilots and the manifesto. We focus on the three case studies presented here. Broadly the Indian manifesto on knowledge and democracy explores the 'new social contract of science in India' following Gibbons (1999) ideas on socialization of science set in the Western context. The Knowledge Swaraj (KS) documents suggests that there have been rich Indian traditions of 'society speaking to science', Gandhi's *Hind Swaraj* being a good example. KS manifesto argues the case for a need to relook at expertise and how 'non-scientists can and should be consulted on choices of priority, policy and ethics.' It seeks to go beyond the dichotomy between tradition and modernity in Indian science by arguing that it is only by being more open to critiques of science from scientists, social scientists, citizens, activists that science can benefit from the rich indigenous Indian traditions of science. This drawing of ideas need to be part of the method of science and

not just in a utilitarian sense of looking for active ingredients that could be of use in existing health systems or with a view to celebrate a hoary past. A corollary of this is the idea that society becomes unduly vulnerable when it does not celebrate its plurality of knowledge systems. In this revitalisation of a new and more active social contract experiments on science and technology from civil society needs to be taken seriously.

The first case study looks specifically at the idea of the violence of the scientific method and its implications for medical ethics. The investigation of the practice of unindicated hysterectomy in rural Andhra Pradesh is a good example of how the easy access to technological systems of diagnosis has led to medical science taking a back seat and the dynamics of the industry determining the path of treatment. The practice of unindicated hysterectomy as was evident in the focus group discussions indicated how despite the absence of scientific basis for such interventions the practice is ubiquitous especially with people who are vulnerable due to their economic status and because of their gender. The case study indicates how techno science, ethics and violence can in today's India create an unhealthy practice that needs the attention of scientists and technologists. It also shows the importance of technological responsibility best exemplified by the committed work of professional doctors as possibly a more effective way of addressing the situation than the legal path of banning practice. The idea of technological responsibility and socialised scientists in action is one of the contributions of the case study to the manifesto. The other is the need to look at the gender aspects of science more closely.

The second case study looks more closely on how knowledge is reconstructed at the time of disasters. The construction industry's ecological foot print is one of the biggest in terms of climate change and the case looks at how people's choices can be reduced at the times of natural disasters during reconstruction with the built environment being transformed from one that has space for plurality to one that seeks to standardize construction and rehabilitation. Through a detailed analysis of different responses to three big natural disasters in 21st century India the case shows how people's choices can indeed be built into the reconstruction process often leading to better results for both the communities and the government. This would however require a more serious examination of the guidelines and the way they are constructed. The case shows how communities have been able to seize initiative in establishing plurality, sustainability and justice and how technologically responsible designers such as Laurie Baker have exemplified this in their work even as they continue to be ignored in mainstream professional architectural practice.

Finally the third case study looks specifically at the role of civil society in providing alternatives in science and technology. The case looks at experiments in democratizing the water sector in Andhra Pradesh by showing first how scientific expertise is currently distanced from society leading to ineffective designs and unequal access of water services. The pilot looks at three cases that represent different scales of water management and design but also differing roles and effectiveness of civil society. The first shows how a different expertise that is more socialised can offer a frame of reference for river basin management by following a river both physically and over time. By connecting the dots the case shows how the inability of different forms of expertise to talk to each other can create conflicts and designs of complex river systems needs to be more aware of this. The lack of public access to scientific data comes in the way of scientific citizenship of the people. The second case study looks more closely at alternatives by showing how civil society can indeed play an important role in working out alternatives to 'wicked problems' of water management by enabling spaces for scientific expertise to work along with peoples intimate knowledge of their region to work alternatives and avoid the 'tragedy of the commons'. The third case study looks at an intermediate level of watersheds and demonstrates how public spaces such as Technology Resource Group and Annual Network Meetings need to be created that enable knowledge dialogue in establishing institutions for sustainability, plurality and justice. Two other case studies on knowledge issues on sustainable agriculture focused on Non Pesticidal Management in Andhra Pradesh and democratising climate change debates were done and in this handbook are presented as linked to the processes of socialisation of science through the consultative workshop and focus group discussions.

The handbook ends with how the vision of the manifesto has been taken to the mainstream S&T establishment in India through the carefully designed focus group and consultative workshops. These have important policy implications for the way we look at knowledge transfer and how we need to move from a linear model of knowledge transfer of research and development to a more complex, iterative, and dynamic system of innovation that can lead to a more harmonious science and technology policy that is socially embedded and cognisant of the principles of sustainability, justice and plurality.

2. Medical Ethics: A case study of Hysterectomy in Andhra Pradesh

By Dr V Prakash, S V Kameswari¹, Life - Human Reinforcement Group

2.1 The Issue:

Life-HRG (Human Reinforcement Group) is a not-for-profit organization that has been providing basic healthcare services to rural masses in the arid district of Medak, hundred kilometers from the state capital Hyderabad in the state of Andhra Pradesh. The NGO observed a number of young rural women undergoing hysterectomy operation (along with removal of ovaries) as a solution recommended by qualified and certified allopathic medical practitioners in the area they work in. The indiscriminate resort to the surgical treatment has far-reaching health implications to the women. Life-HRG had, as part of its work, registered a total of 171 women under 40 who had undergone unindicated hysterectomy in just one administrative block of Medak district. The women had gone to the doctor with complaints like abdominal pain and white discharge, abdominal pain, spotting, white discharge, white discharge with foul smell and itching and genital prolapse and were recommended to undergo hysterectomy. Reasons for this appeared to be a multidimensional – the socio, economic, cultural background of the women that resulted in lack of awareness/knowledge and power wielded by the medical practitioners to influence the decision.

This practice is not a standard recommended practice even in modern medicine and is often seen in medical texts as a solution of last resort. Many times, conditions for which doctors suggest hysterectomy can be successfully treated with alternatives to hysterectomy that include less invasive surgeries and pharmacological treatments. Even when the surgical treatment is compulsory, within the limitations, there exist 3 to 4 kinds of hysterectomies with varying degrees of post-operational effects. Hysterectomies involve removal of one or all of the following organs: cervix, uterus, and the fallopian tubes and both ovaries. The kind of hysterectomy to be done depends on the specific condition of the patient. But most of them result in hormonal

¹ The case study team included the team leaders Dr.Kameswari.S.V and Dr.Prakash Vinjamuri of Life - HRG, research associates Dr Rama Padma, Dr.K.V.Radha Krishna & Thomas Mougey, resource support by Dr.Prasun Deb. Expert documentation assistance was provided by Dr Rekha Abel and the National Institute of Nutrition (NIN) provided institutional support for the case. Dr Prajit K Basu helped the case in an advisory capacity from early days providing comments on earlier drafts. Ms Kavitha Kuruganti provided valuable editorial help in the final stages. Contact lifehrg@gmail.com

imbalances, which required long term treatment. They also alter the biological and sexual clock of the women with long term adverse consequences. Women who have undergone hysterectomy have a greater risk of heart disease and osteoporosis, and are more likely to become depressed. Unfortunately, there is little follow up care for hysterectomised women.

Since hysterectomy has such long-term effects on a woman's health, longevity, it is important for them to understand all possible consequences. They should understand when hysterectomy is an option and when it is necessary to save one's life. Moreover traditional healthcare solutions have had a different outlook to a large extent for a number of gynecological problems. Going for a hysterectomy, therefore, is a serious decision, which should be an informed one, based on individual case history. Both the doctor and patient should work together to determine the right treatment option for the latter. The doctor should also be able to suggest alternative treatment, including from the Indian Systems of Medicine. Medical ethics should surely demand this from the medical practitioners as per the authors of this case study.

2.1.1. The Current Study

This study sought to explore the relations between science and ethics through the examination of the practice of hysterectomy. This is a study among rural women of AP, who have been advised and have undergone hysterectomy operations. The case study explores current practice in the field and compares this with medical ethical guidelines of ICMR to see where these have been followed and where the shortcomings are. It is based on the experiences of a doctor-couple interested in public health who came across an unusually high incidence of surgical treatment that has become common practice in the region that they work.

The case study relates to the issue of science and ethics as it plays on women's health and explores: the medical ethical guidelines in practice (or absence of the same), including informed consent. Whether or not the condition of a woman warranted hysterectomy, was there an alternative available, if the alternative was available why hysterectomy was preferred by the practitioner, what other socio-cultural factors were at play in the decision-making processes, the nature of violence perpetrated against the women and their bodies etc.

few cases of gynecology problems, which were successfully addressed by the healthcare practices without hysterectomies. In doing so, the positing of the need for a new framework to democratize the relationship between different systems of knowledge on healthcare and for a different medical expert-patient relationship.

2.1.2 Methodology

This case study chose to explore what the ethical concerns raised by the unindicated and risky recourse to hysterectomy in the Medak district are and the absence of medical ethical guidelines in practice including the much-touted 'informed consent', the consequent financial and health burden on the women and the inability to look at alternate practices of medical knowledge by adopting the following methodology:

1. Administering a questionnaire to 171 women under 40 years, registered with LIFE-HRG;
2. Taking up a survey in 12 villages of Munipally block in Medak district in Andhra Pradesh administering a questionnaire to 265 women who had either undergone hysterectomy or not
3. An analysis of the evolving discourse on medical ethics as reflected in the Code of Ethics evolved by the Medical Council of India and as reflected in the content of Indian Journal of Medical Ethics and specifically on Informed Consent and Doctor-Patient relationship
4. Collecting the case studies of a few women who were treated in Life-HRG and about the alternative approaches possible.

In the process, the case study also explores which population is vulnerable to the lack of ethics in this sphere.

The combination of Life-HRG documentation on the women they treat and the circulation of a structured questionnaire among Life-HRG's patients and in the 12 villages in Munipally Mandal was used to understand hysterectomy from the patient's side and yields important insight for understanding medical decision-making, and the (assumed) prevalence of radical and definitive solution, e.g. hysterectomy (voluntarily as well as involuntarily) sought by the women. The understanding of this pattern of compulsory hysterectomy from the women's perspective involves: investigation of the socio-economic background of the women, women's utilization of healthcare systems, family structure, reproductive behaviour and sexual behaviour to determine to what extent hysterectomy is determined by the social and gender dynamics of rural society, diffusion and state of health/medical knowledge among rural population and perception of medical authorities (figure, purpose, practice, interaction). The data collected by LIFE-HRG of its patients over the past several years further yielded a general understanding of the physical nature of the harm in the short as well as the long run done to the women hysterectomised. This

aspect highlights the nature and extent of violence perpetrated against these women; extensive qualitative interviews with these women aimed at uncovering the social, psychological and economic aftermath of the surgeries.

Along with the investigation of the medical practice from the perspective of the practitioner, collecting the perspective and subjective experience of the patient's encounter/interactions with the medical system at large to reconstruct the intricate process from both sides (doctor & patient) provided a rich insight on the nature of the patient-doctor relationship and indicated patients' perception of the "doctor figure".

An attempt was made to analyse the existing 'ethical framework' (Indian Council for Medical Research or ICMR guidelines) and to analyse to some extent the recent debates on medical ethics in India as reflected in the Indian Journal of Medical Ethics, to understand the state of medical ethics in India.

This discourse analysis was taken up as a reflection of the on-going process of medical-community-based re-conceptualization of ethical obligation of the physician. In a context of authority crisis and growing community distrust in its regulatory bodies, the discourse analysis aims at uncovering the process of reconstruction of the doctor's figure (authority, responsibility and ethical obligations), the profession's worldviews and practice (interrelation between medicine and society, understanding of health issues, nature of the practice) and a re-definition of the doctor-patient relationship, as a means to contextualize the ethical concerns raised by compulsory hysterectomy and the ethical challenges and alternatives explored and implemented by Life-HRG.

Further, this paper studied the medical approach of Life-HRG (Dr Prakash and Dr Kameswari) to the issue of unindicated hysterectomy through extended interviews as an alternative approach that is indeed possible, devoid of violence and establishing a new kind of practitioner-patient relationship laying down a new code of ethics in practice.

2.2 Hysterectomy – The Clinical Picture

Hysterectomy is the surgical removal of the uterus. It is the most commonly performed gynecological procedure. Hysterectomy may be total – removing the uterine body and the cervix, or subtotal – removing the uterine body but keeping the cervical stump intact. Removal

of uterus also removes the child bearing capability of a woman and changes her hormonal levels. According to text books, hysterectomy is to be done to save life, relieve suffering and to correct deformity. However, according to reports, over 600,000 hysterectomies were performed in the US alone in 2003, of which over 90% were for benign conditions². This led to a major controversy that hysterectomies are being performed for unwarranted reasons. In India, surgical menopause is common in women over 22 and osteoporosis – a common byproduct of menopause – is the highest debilitator in both rural and urban women.

Subtotal and Total Hysterectomy:

Subtotal hysterectomy is when the uterus is removed but the cervix is left intact. This is done in dire obstetric emergencies such as uncontrollable post partum hemorrhage and ruptured uterus to save the life of the woman. It is generally agreed that subtotal hysterectomy should be reserved for extremely moribund conditions. There is the likelihood of more cancer incidence in the cervical stump. In the 1940s, around 95% of the hysterectomies conducted in the US were subtotal. But in later years with improvements in surgical technology and preventive measures for cervical cancer, total hysterectomy became the norm.

Total hysterectomy is the removal of uterus along with the cervix. This is recommended when the following indications are present – fibroids, endometriosis that is not cured by medicine, uterine prolapse, cancer of the uterus, cervix or ovaries, persistent vaginal bleeding and chronic pelvic pain. Other options should be explored and explained to the woman before total hysterectomy is opted for. Since there is surgical disruption of the blood supply to the ovaries, total hysterectomy affects the functioning of the ovaries which produce the precious estrogen that protects women's health.

Total hysterectomy with bilateral salpingo oophorectomy is where the uterus, cervix with tubes, and ovaries are removed. With this there is a sudden onset of menopause. This is generally recommended as preventive measure for ovarian cancer. However, ovarian cancer is quite rare and accounts for only 3% of the cancers and about 1% of deaths in women. Removal of ovaries is not recommended as it increases the woman's overall risk of death by 40%. Post menopausal ovaries produce androgens that can convert into estrogens to protect the bone and blood vessels.

² Wu, JM, Wechter, ME, Geller, EJ, et al. Hysterectomy rates in the United States, 2003. *Obstet Gynecol* 2007; 110:1091 ; "[Are Hysterectomies Too Common?](http://www.time.com/time/health/article/0,8599,1644050,00.html?cnn=yes)". *TIME Magazine*. 2006-07-01. <http://www.time.com/time/health/article/0,8599,1644050,00.html?cnn=yes>. Retrieved 2007-07-17.

2.2.1 Early Hysterectomy – The Work of Life - HRG

In response to the situation of large numbers of unindicated hysterectomies in women under 40 and the lack of follow-up care and support for these young women, *Life*-HRG has been exploring the impact of early hysterectomy on the health status of the women. To do this, *Life*-HRG (1) Registered women under 40yrs who had undergone hysterectomy; (2) Classified them based on preliminary investigations; (3) Followed up further with high risk category, with specific clinical investigations.

This was to get a picture of the extent of cases which warranted a hysterectomy and the risks that hysterectomised women face. Before presenting details of the clinical condition of the women who underwent (early) hysterectomies in this study, given below is the standard medical procedure for hysterectomy – the symptoms and recommended treatment.

Some of the common complaints for which women seek medical intervention are:

- Pain in the abdomen and white discharge
- Pain in the abdomen
- Spotting
- White discharge
- White discharge with foul smell and itching
- Genital prolapse

The root causes of the above symptoms and treatment protocol as suggested in the gynecology text books are presented below:

- Pelvic inflammatory disease (PID) is an infection of the upper female genital tract, i.e. infection of the uterus, cervix, fallopian tubes, and/or ovaries. Although a Sexually Transmitted Infection (STI) is often the cause, many other routes are possible, including post-partum, post-abortal etc. Fever, cervical motion tenderness, lower abdominal pain, new or different white discharge, painful intercourse or irregular menstrual bleeding are the symptoms. Treatment depends on the cause and generally involves use of antibiotic therapy. Treating partners for STIs is a very important part of treatment and prevention.
- Pelvic inflammatory disease is common in young women who are sexually and reproductively active. While increased promiscuity and multiple sexual partners are held to be the main reasons for PID in developed countries, in the developing countries, septic

abortions and puerperal sepsis (severe infection following childbirth, caused by infection of the placental site) are the important causative factors.

➤ Chronic cervicitis is very common and is found in about 80% of women who have some gynecological complaint. Chronic cervicitis represents a form of focal sepsis, is brought about by introduction of infection during abortion or child birth due to lacerations of the cervix³. It can also be the outcome of STIs. Cervicitis in acute stage can be effectively treated with antibiotics. It is difficult to eradicate the chronic cervicitis completely with medicines because of the nature of the mucous membrane.

➤ The cervix, or neck of the uterus, covers the cervical canal, the normally tiny passage through which a newborn must pass on its way into the world. Located at the inner end of the vagina, the cervix is vulnerable to a variety of sexually transmitted diseases. The delicate covering of the outer cervix is also prey to injury, which can strip off the surface layer of cells, resulting in cervical erosion. The cells lining the cervix are sometimes subject to abnormal growth as well, starting as cervical “dysplasia” and possibly progressing to cancer.

Recommended treatment and clinical procedures for the above disorders are the following:

- Acute cervicitis can be effectively treated with antibiotics.
- Pap smear is to be done to detect the presence of abnormal cells or dysplastic cells on the surface of the cervix. It is a sensitive and reliable screening test for cervical cancer.
- Chronic cervicitis is a form of sepsis. Apart from antibiotics, other treatments are available, one of which is Cryosurgery – a safe, painless procedure that involves the use of extremely cold nitrous oxide gas. The gas is used to freeze and kill abnormal cells on the wall of the cervix. It is less painful, less expensive and easier for the physician to control and monitor.

2.2.2 The case of the women in Municipally Mandal of Medak district

Life-HRG registered a total of 171 hysterectomised women from fifteen villages of Municipally mandal of Medak district in Andhra Pradesh. Initial awareness camps followed by weekly

3 In the present study, barring 3 or 4 women, all had had home deliveries and no ANC or TT injections.

meetings with women and health workers from 5-7 villages led to the registration of 108 women who had early hysterectomy. Later, the word spread and the remaining women approached Life-HRG for registration. All 171 women were under the age of 40 at the time of the registration (October 2008 to June 2009). Most of the women were underweight and belong to the lower income group. Following is a detailed description of the women and their clinical condition. The socio-economic characteristics of the women are analysed in a subsequent section of the report.

Table 2.1.: Age⁴ at Marriage (Details available for 148 women – it was not possible to elicit age for 23 women):

Details	Number (n=148)	Percentage	Remarks
Women married before menarche	33	22%	Youngest married at 7
Women married after menarche but before 18 years	114	77%	Average age at marriage – 14 years
Women married after 18 years	1	1%	

Observations:

- In India the minimum legal age for marriage for women is 18 years. 147 of the 148 in the sample were married as children.
- Compared to older women, younger women are more susceptible to sexually transmitted infections due to biological factors such as hormonal fluctuations and permeability of vaginal tissue.
- Predisposing risk factors for cervical cancer are coitus before the age of 18, delivery of the first child before age of 20 and poor personal hygiene (Source: Shaw text book of Gynecology, prescribed text book for undergraduate medical students)

4 It was not easy to elicit the age of women – only 5 women in the study group could clearly state their age. But they were able to link time of menarche with time of marriage and given that the average age for menarche is 13, the age of the women has been calculated accordingly.

Table 2.2.- Age at First Child: (Details available for 141 women):

Age group of women	Number	Percentage	Remarks
13 – 15	67	47%	Average age at first child – 16 years;
16 – 19	66	46%	
20 – 23	8	6%	

Observations:⁵

1) Mothers in the 15-19 years age group face a 20-200 percent greater chance of dying in pregnancy than those aged 20-24. Those under age 15 are 5 times as likely to die as women in their twenties. The main causes are hemorrhage, sepsis, pre-eclampsia/eclampsia and obstructed labor (birth canal and pelvis are not fully developed).

2) For every woman who dies in child birth, 30 more suffer injuries, infections & disabilities, which usually go untreated and some of which are lifelong. (Mild injuries and lacerations of the cervix during childbirth may present themselves as chronic cervicitis at a later date, for instance)

3) Part of this heavy toll has more to do with poor socio-economic status and lack of ante-natal and obstetric care than physical maturity alone. However physical immaturity is the key risk for those under 15.

4) If a mother is under 18, her baby's chance of dying in the first year of life is 60% higher than that of a baby born to a mother older than 19 years.

The following table presents data both on present age as on December 2009 and age at the time of hysterectomy.

5 Source: Early marriage Child Spouses UNICEF Innocenti digest # 7, March 2001. <http://www.unicef-irc.org/publications/pdf/digest7e.pdf>

Table.2 3 - Age at Hysterectomy:

Details	Age			Total
	< 30	31 – 35	36 - 40	
Present age:				
No of women	67	51	49	167
Average age	26.4	33.2	38.4	31.9
Age at Hysterectomy:				
No. of women	92	42	20	154
Average age	24.6	32.7	37.7	28.5
Percentage	60%	27%	13%	

Observations:

- Average age at the time of the study – 31.9 years
- Average age at which surgeries were done – 28.5 years
- Only 13% had hysterectomies between 36 – 40 years
- 60% had hysterectomies before the age of 30
- For those under 30, the average age at which hysterectomy was done – 24.6 years
- On a temporal scale, while the average age of hysterectomy for older women in the group was 37.7, for the younger women it is 24.6 years indicating that more and more, these surgeries are being performed on younger and younger women.

Table.2.4 – Place of surgery:

Name of institution	No of surgeries	Percent
Government Institutions:		
AP Vaidya Vidhana Parishad, Sangareddy, Medak district	2	
Gandhi Hospital, Secunderabad	2	
Government Hospital, Sangareddy	2	
Niloufer Hospital, Hyderabad	1	
Osmania General Hospital, Hyderabad	1	
Total government	8	
Private Hospitals	163 Print mistake	95%

Observations:

Those who were referred to government hospitals were those who had some hormonal or other symptoms. Private hospitals only treated those who were “healthy” with no history of other symptoms.

All surgeries done in Government teaching institutions had clear indication and good post operative notes.

However, at the district level, though post operative notes are available, the indication is not clinically justifiable.

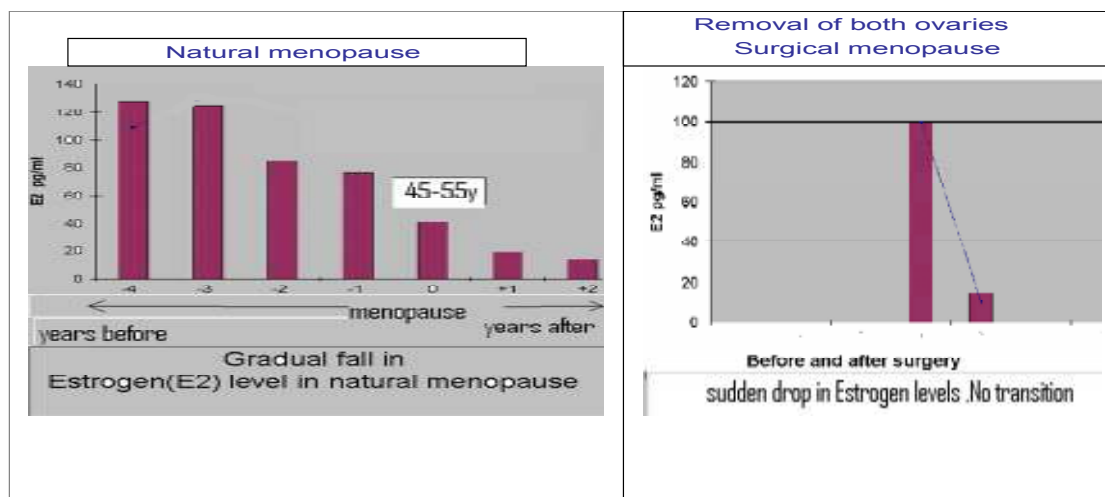
For the 162 cases that were done in local private hospitals, the discharge summary is mostly blank with no information about procedure done or the follow up instructions.

Table.2.5 – Surgery details (out of 165 done by abdominal route):

Type of surgery ⁶	Number	Percent
Total Abdominal Hysterectomy (TAH)	32	19%
TAH+Left Salpingo Oophorectomy/Right Salpingo Oophorectomy (LSO/RSO)	47	29%
TAH+Bilateral Salpingo Oophorectomy (BSO)	53	33%
Records not available	33	20%
Total	165	

Observations:

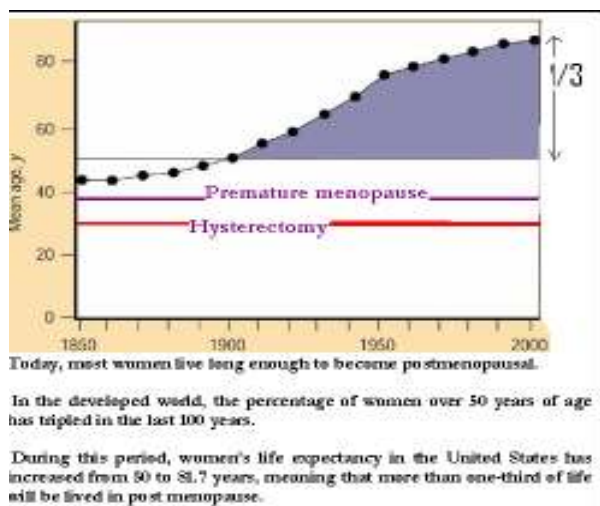
- High percentage of women were subjected to ovaries removal
- Removal of ovaries is the biological equivalent of castration and results in the immediate and sudden onset of menopause in contrast to natural menopause which is a gradual process. The figure below shows the impact of TAH+BSO on estrogen (E2) levels in natural menopause as opposed to the sudden drop in estrogen levels without any transition in this surgical menopause.



6 TAH – Total Abdominal Hysterectomy; LSO – Left Salpingo Oophorectomy, RSO – Right Salpingo Oophorectomy, BSO – Bilateral Salpingo Oophorectomy. The removal of an ovary together with a fallopian tube is called salpingo-oophorectomy or bilateral salpingo oophorectomy if both ovaries and tubes are removed.

2.2.3 Understanding Early Menopause and its Effect on Womens Health

Menopause is defined as the time of cessation of ovarian function resulting in permanent stoppage of the menstrual cycles. Most women reach menopause between the ages of 45 and 55, with the average age around 50. However, about one percent of women experience menopause before the age of 40 years, which is known as premature menopause (the woman's ovaries spontaneously stop producing eggs and the underlying cause may not be found). In some cases, early menopause is brought on by surgery to remove the ovaries or by medical treatments such as radiation therapy and chemotherapy.



The ovary is almond shaped, pearly grey in color & the surface is slightly corrugated. Before puberty the ovaries are small. After menopause they atrophy & become shrunken. During reproductive years the hormones produced in ovary are estrogen, progesterone, inhibin, and in small amounts testosterone and androstenedione (can get converted to weak estrogen in the fat tissue). The increased stromal cells (connective tissue cells) of the menopausal

ovary continue to produce androstenedione which gets converted to oestrone. Though weaker than estrogen (10 times less potent than regular estrogen) oestrone is capable of exerting estrogenic effect on the target tissues.

After menopause, estrogen production falls. Although estrogen is a female sex hormone, it has many functions other than reproductive function and one such function is to protect from degenerative loss. Estrogen is the hormone that helps prevent calcium loss and bone breakdown in women. Just before or during menopause, estrogen levels decrease and insufficient amounts of estrogen may lead to bone loss. Hence, due to a drop in estrogen level in the immediate five years of menopause a woman may lose up to 15-25% of bone mass, leading to mild to moderate or severe osteoporosis⁷. When the natural onset of menopause comes earlier than expected or when it is caused by the surgical removal of ovaries (in case of TAH, medical knowledge about post-hysterectomy ovarian function is limited), a woman's

⁷ A systemic skeletal disease characterized by low bone mass and micro-architectural deterioration of bone tissue with a resultant increase in fragility and risk of fracture

estrogen protection is reduced for a longer period of time span compared to natural menopausal situations and possibly heralds an onset of early complications.

2.2.4 Medical Procedures carried out for the Hysterectomised Women

Table.2.6: Recommended and actual medical procedures carried out for the hysterectomised women

Recommended Procedures	Observation – what was done
Pap smear is a simple and basic screening procedure that helps in the early detection of cervical cancer	Pap smear was done for <u>two</u> women only. This was in MNR and AP Vaidya Vidhana Parishad in Sangareddy in Medak district.
After surgery, Histo-Pathological Examination (HPE) is a required follow up procedure to assess impending malignancy	HPE was done in <u>one</u> case only.
The men also require medical interventions and need to be followed up with antibiotics to prevent onset of pelvic infections	Antibiotics were not given to the sexual partners or an inadequate dosage was given.
Cyrocure is a simple, painless outpatient procedure that helps in healing cervicitis	Not a single woman had cyrocure.

The above table clearly establishes that no recommended procedures were taken up or were taken up in a very inadequate fashion.

2.2.5 Identification of Women in the High Risk Category and Further Interventions

Hysterectomy impacts the production of estrogen which is an important player in maintaining the health of the women. To find out more about the high risk category of hysterectomised women (extent falling under this category), 160 of the 171 registered women with Life-HRG were subjected to initial clinical investigations which were done at the village level in the Urdu Primary School, Peddachelmada, Medak District. The blood investigations were a) Serum Follicular Stimulating Hormone (FSH)⁸, b) Hemoglobin Percentage and c) Blood Grouping and Typing.

8 Follicle-stimulating hormone (FSH) is a hormone synthesized and secreted by the pituitary gland. FSH regulates the development, growth, pubertal maturation, and reproductive processes of the human body. In both males and females, FSH stimulates the maturation of germ cells. FSH levels are normally low during childhood and high after menopause. This high FSH level continues for the rest of a woman's life. The monthly events that take place in the ovary are cyclical during reproductive years. During 1st week of the cycle FSH value is raised to stimulate the maturation of germ cells (follicles) in the ovary. (Upper level is 10 best measured during 3rd or 4th day of cycle) Of the several follicles, one follicle grows faster than the rest and produces more FSH receptors & estrogen. The rising estrogen level causes –ve feedback to pituitary gland leading to fall in FSH level by 7th day of cycle. After menopause, as the ovary shrinks and estrogen levels fall, the blood level of FSH rises gradually in response to the falling estrogen levels. Elevated FSH level (40 iu/ml) can be measured by testing the blood.

Life-HRG used the FSH values to classify the women into high risk categories for follow up treatment. As the women are not menstruating and the time of the cycle cannot be determined given that the post-menopausal rise of FSH level continues for the rest of a woman's life, the women were tested thrice during the last one year at four-monthly intervals to determine the consistent rise of FSH and identify the women who showed consistently high values as the high risk group. They are termed as the high risk group as they have entered artificial, premature menopause. While the incidence of natural menopause is 1% in the under-40 age group, *Life*-HRG found that 41.25% of the hysterectomised women have had early menopause and fall in the “high risk category”.

Table.2.7 - FSH Values in women with early hysterectomy:

Details	FSH values			Total
	> 40	10 – 40	< 10	
Total number of women (n=160)	66	14	80	160
Percentage	41%	9%	50%	
Number of women below 30years	21			
Number of women between 30-40 years	45			

From the interviews with the 171 women registered with *Life*-HRG and further clinical investigations, the following facts emerge clearly:

- Most of the women were married as children (average age was 14 years) and the average age at first delivery was just 16 years. The complications and risks associated with these phenomena are apparent.
- Further, the average age at which hysterectomies were performed on 154 women for whom data was collected was 28.5 years. 60% of the sample had hysterectomies before the age of 30 years and for these women, the average age at which the surgery was performed was just 24.6 years.
- On a temporal scale, while the average age at hysterectomy for older women in the group was 37.7, for the younger women it is 24.6 years indicating that more and more, these surgeries are being performed on younger and younger women.
- An overwhelming majority (around 95%) of the women got the surgeries done in private hospitals.

- From the hospital documentation available with the women, it is clear that private hospitals only treated those who were “healthy” with no history of other symptoms, while those who were referred to government hospitals were those who had some hormonal or other symptoms. The surgeries done in government teaching institutions had clear indication and good post-operative notes. The indication is not clinically justifiable in the case of a district level government hospital while the discharge summary from private hospitals is mostly blank, with no information about procedure done or on follow up instructions. It is clear from the interviews and these documents that the surgeries performed were unindicated in these cases.
- It is apparent that a high percentage of women were subjected to ovaries removal (33% and in fact, this is 40% of the women for whom information is available on the exact nature of the surgery). Removal of the ovaries is the biological equivalent of castration and results in the immediate and sudden onset of menopause in contrast to natural menopause which is a gradual process.
- Such “surgical menopause” leads to sudden drops in estrogen levels without any transition. Although estrogen is a female sex hormone, it has many functions other than reproductive function and one such function is to protect from degenerative loss.
- It is also apparent from the findings that post-surgical medical procedures whether that of a pap smear or HPE were either not taken up or done in a minuscule number of cases. This is a clear reflection of the lack of follow up procedures.
- Further clinical investigations by Life-HRG (on FSH values, for instance) show that many early-hysterectomised women fall in the high risk category.

It is also clear that there is a lot of research still required to understand the impact of hysterectomy on the health of women. There is very little knowledge regarding the function of ovaries beyond their reproductive function. According to standard Gynecology and Obstetrics textbooks ovarian function lasts for only 5 years. But that is not firmly established. A possible explanation for altered ovarian function after hysterectomy is reduced ovarian blood supply caused by the surgery, but the existence of a direct endocrine function of the uterus cannot be excluded. Women undergoing hysterectomy without oophorectomy in their premenopausal years would expect to benefit from continued secretion of estrogens to protect them from the conditions and symptoms associated with the climacteric and postmenopause. Most studies done have looked at postmenopausal women in the above-40 age group. There are no studies

that examine women in the under-40 age group. There is need for a long term prospective study to fully understand the implication of subtotal or total hysterectomy on the women, and the ovarian function. Given the incidence of many apparently unindicated hysterectomies in the women studied by Life-HRG, it becomes important to understand the various factors that led to the surgery decision and what role did the medical experts have to play in the decision-making and whether they adhered to at least the laid-down ethical guidelines.

2.3. Hysterectomy – Social Factors and Consequences

Most of the available studies on hysterectomy focus on the medical aspects which are related to either 'procedure' or 'time' of the surgery and rarely give details about the situations leading to hysterectomy (Leonard EL and Kreutner AK, 1971; Haynes and Martin, 1979; Atrash et.al., 1982; Loizzi P. et.al.; 1990; Scott et. al., 1997). A few other studies are focused on utero-vaginal prolapse leading to hysterectomy (Datta and Datta, 1994). Studies related to social determinants of hysterectomy are not many.

In recent times, social researchers attempted to work on a few of the related aspects such as menstrual health and gynaecological ill health. Some studies have exposed that menstrual disorders constitute major reproductive health problems (Patel, 1994; George, 1994; Bhatia and Cleland, 1995) and excessive bleeding is considered as a serious illness. Often it is associated with blind belief (Patel, 1994) or as a consequence of a contraceptive usage (George, 1994). Some other studies also have focused on menstrual problems as a consequence of surgical contraception (Puryastha, Bhattacharyya, 1992). Women perceived regular menstruation itself as an inconvenience for daily activities. Once the desired family size is achieved they wish not to have these cycles. A study by Joshi (1998) revealed that some women viewed hysterectomy as a long-term solution to the 'pain' and 'dependency' during the days of monthly menstruation.

A few other studies have highlighted how women do not recognize and neglect to take treatment for reproductive tract infections (RTIs) because these are asymptomatic (Wasserheit et al., 1989). Poor women also get increased risk of RTIs because of unhygienic management of menstruation. Untreated lower tract infections are likely to progress to pelvic inflammatory diseases. The community-based research on women's gynaecological health in India by Rani Bang (1991) showed that ninety two percent suffered from one or more gynaecological problems. This study not only brought out the magnitude of the gynaecological morbidity but also focused

on the neglect associated with these problems. Christopher Elias (1991) in a study revealed that women had specific complaints such as genital sores, vaginal discharge and pelvic pain and these were actually related to sexually transmitted diseases (STIs). It is evident from various studies that the stigma associated with STIs discourages women to attend STI clinics. Barely a third of the patients in STI clinics are women (Jeyasigh et al, 1985; Mathai et al, 1991). On the other hand the primary health care programme in India does not have adequate facilities to attend to all sorts of reproductive care.

In Andhra Pradesh, as is the case with most parts of the developing countries, there is a deficiency of data pertaining to Hysterectomy. Nevertheless, there is indirect evidence that is available on the percent of women who have attained menopause before completing the reproductive period of life. This data suggests the probable role of Hysterectomy as the cause for early onset of menopause. According to second National Family Health Survey, 31.4 percent of the women in the reproductive age group have already attained menopause in Andhra Pradesh (IIPS, 1998-99). A further analysis by their age reveals that amongst the women who have had early menopause within the reproductive age group, nearly one-third of them (31 percent) are in the age group of 30-34 years, followed by the women in 35-39 years (29.5 percent), 40-45 years (25.1 percent) and 46-49 years (14.0 years). The data also suggests higher percentage of women with early menopause is associated with relatively younger ages. In addition, observations by a few medical experts reveal that in Andhra Pradesh there are more and more women of younger age group i.e. less than 30 years who are undergoing Hysterectomy. All these collated information suggests the possibility of decrease in the age at Hysterectomy in Andhra Pradesh.

While on one hand we have sporadic information suggesting the rise of cases of Hysterectomy as well as decrease in the age at the surgery; on the other hand, a number of studies on utilization of health services indicate women are poor utilizers of healthcare. For instance, the two national surveys by NCAER (1992) and the NSSO (1992, 1998) examined both women's and men's utilization of health services. These surveys have indicated that there is a gender difference in favour of men in utilization of health services for in-patient as well as out-patient care. Variations in utilization across age groups and within each sex have revealed a higher rate of utilization for males than for females, and there were also variations across various age groups of females. Female children (0-11 years) had a greater proportion of illness episodes treated as compared to girls and women above this age (Madhiwala et al 2000).

A vast majority of specific studies that had information on women's utilization of health services and dealt with reproductive health services have focused on maternal health, i.e. especially pregnancy and delivery care and family planning. The overwhelming evidence in this regard relates to women's non-utilization of health facilities and indicated that women distrusted medical care or were reluctant to be in-patients at hospital. Studies examining the association of various socio-economic factors with utilization of services find that women using services were economically better-off than those not (Khandekar et al. 1993), had more years of education themselves as well as were married to men with more years of education (Khan et al. 1997), were non-working women and did not belong to the Scheduled Castes (Khandekar et al. 1993). In terms of choice of provider for reproductive healthcare, a preference for traditional means of care is indicated by many studies. The low cost of services appears to be an important consideration (Sahachowdhury 1998; Gantra et al. 1998b).

Regarding women's health-seeking behaviour in rural India, especially with respect to reproductive ill health, most of the women in both rural and urban areas have preferred to tolerate their ill health. Still many believe in non-disclosing the situation to maintain one's 'self-respect'. Even if they have decided to seek a treatment, often they prefer self-treatment or have been approaching unqualified health personnel. Such perceptions and beliefs constitute a "lay-health culture" which would intervene between the presence of morbidity condition and its necessary treatment (Sugathan and others, 2001).

Therefore characteristics of health care delivery system may not be the complete explanatory factors of utilization of health services. Other factors such as the social structure and characteristics of individual are also the determining factors of the utilization of health services. In trying to understand the determinants of utilization of health services by women, Chatterjee (1990) hypothesized the role of **need, permission, ability and availability**. She reasoned that when permission and ability interact with need, a demand for health services is generated. Actual utilization of health services occurs when this generated demand overlaps with availability. Within the Indian context, she says, the situation is further complicated by women's perceptions of illness, which are affected by women's cultural conditioning to tolerate suffering. This tolerance further varies with type of ailment and by region, which in turn results in low perception of need for health services when the actual need is great.

To further understand the factors that led to hysterectomies, an interview schedule was administered through a household level survey in twelve villages of Munipally mandal of Medak

district in Andhra Pradesh. This helped in listing the symptoms and evolving a correlation between bio-medical conditions and self-reported symptoms. Further, focused group discussions were organized with a few women who underwent hysterectomy and those who did not. In-depth interviews were also held with local healthcare providers, i.e., RMPs (Registered Medical Practitioners). Consent forms were used to obtain informed consent from the women who were interviewed.

The data collection was carried out in twelve villages of Munipally mandal (block) of Medak district in Andhra Pradesh. The villages were: Peddachelmada, Antharam, Melasangam, Tatipalli, Mansanpalli, Kamkollu, Mogdhampalli, Pillodi, Chupalli, Garlapalli, Makthakrasaram, Bellur, Mallikarjunapalli, Allipur. The total number of women interviewed was 265 out of which 132 women had hysterectomy.

2.3.1 Sampling for the study:

It was decided that at least one-third of the 32 villages in Munipally mandal would be covered in the study through random sampling and the 12 villages listed above were selected in that fashion. Further, to explore the non-medical dimensions (the socio-cultural and economic conditions in which the women are placed) and processes that led to the hysterectomies in this Mandal, it was considered essential to have all the women who had undergone hysterectomy in the reproductive age group (15-45 years) in these sample villages. For that reason, all the women who had hysterectomy in the reproductive age and residing in the selected 12 villages were interviewed. The researchers came across 133 such women and due to incomplete information of one such subject for further analysis, the sample included 132 hysterectomised women.

It was also considered essential to explore why certain women opt for hysterectomy and others not (and understand general healthcare-seeking behaviour), to study the viewpoint and practices of women of the same age group who have not opted for a hysterectomy in the same villages. With the use of random sampling method, women in the reproductive age group of 15-49 years, who did not undergo hysterectomy in these villages were therefore selected as a control group. The sample size for this group was kept the same as the number of women who had hysterectomy – 133.

The following are the main findings from the field level primary data.

At the time of study, the average age of the women who had hysterectomy in the study villages is 33.4 and of the women who did not have hysterectomy is 28.5 years.

Table.2.8: PROFILE of the Women (expressed in %age)

Background characteristics	Hysterectomy women (n=132)	Non Hysterectomy women (n=133)
Mean age	33.4	28.5
Education Status		
Non-literate	84.8	63.9
1-5 TH CLASS	6.8	7.5
6-8 TH CLASS	5.3	11.3
9-10 TH CLASS	3.0	12.8
11+	0.0	4.5
Caste		
Scheduled Caste	22.0	22.6
Backward Caste	52.3	48.1
General Caste	24.2	27.8
Scheduled Tribe	1.5	1.5
Occupation		
Cultivation	18.9	15.0
Ag labour	62.9	48.9
Household worker	13.6	30.1
Others	4.5	6.0
Wealth index		
Lowest	28.8	29.3
Low	37.9	34.6
Middle	28.0	24.8
High	5.3	11.3
Total	132	133

The socio-economic profile of the women who had hysterectomy in the study villages reveals that a majority of them are non-literate (Table 8). Yet between the groups, more non-hysterectomy women had formal years of schooling and a few also studied beyond 10th class. Nearly half of them belong to *Backward* castes, one-quarter of them fall under *Scheduled* castes and tribes in both groups which could be a reflection of the population in the area. More hysterectomy women (82 percent) work outside home in some income-generating activities than non-hysterectomy women (64 percent). When households are categorized by Wealth index, nearly two-thirds of the women in both the groups fall into either low or lowest groups of wealth index.

2.3.2 Women's health prior to marriage and Health care seeking behaviour

Menarche or marriage is the gateway to participate in reproductive behaviour for all the women in the study villages. It is assumed that the conditions leading to hysterectomy may not be always due to a particular health problem but it might have manifested over a period of time.

Therefore the present study looks at reproductive behaviour and related health status of women ever since menarche to hysterectomy.

The mean age at menarche for the women in the villages is 12.8 years. Once attaining puberty, a majority of the women (94.7 percent) from both groups had menstruation at regular intervals. 11 percent of them mentioned that they have experienced illness during menstruation such as nausea, severe abdominal pain, weakness, vomiting and legs ache prior to marriage. All of them perceived length and volume of menstruation as a natural process and none of them felt the need for a treatment and opined that one has to bear with it. Women by and large are ignorant about causes leading to menstruation-related health problems. Prior to marriage around 10 percent of women in both the groups suffered from white discharge and urinary infection. Unlike ill health during menstruation, women realised the need to seek treatment for these problems. Around 3 percent of the women went for a treatment. The others were not permitted by their parents to seek treatment because of the fear of lessening the chances of marriage if one would come to know of her ill-health. Those who sought treatment preferred quacks as against qualified medical personnel.

2.3.3 Marriage, Sexual Relationship And Gynaecological Health

In the study sample, the age at marriage on an average was 12 years. Barely 6 percent women got married after reaching legal age at marriage - 18 years. Around 20 percent of hysterectomy women and 12 percent of non-hysterectomy women were married off even before attaining menarche. The median time gap between marriage and consummation of marriage is less than a month.

85 percent of the women were ignorant about coitus until marriage. More than half of them initially found it repulsive because of ignorance or fear. Twenty five percent of the women took a couple of months to develop a favourable attitude towards it. During early months of marriage the couple had regular coital relations and husbands never approached other women for sex during this phase. However when women were not able to actively participate in coitus, either during pregnancy or after childbirth, some of their husbands (25 percent) had extra marital coitus with commercial workers or other women. Few of the women were aware of the fact that husbands' sexual practices may impair their gynaecological health. Yet women continued to participate in coitus to preserve the marital relationship. Most of these women are not worried about their health. A few have realized the need to use condoms in the interest of their gynaecological health, yet have not been able to convince their husbands.

About 4 percent of women have agreed that after marriage, they had experienced burning sensation in vagina, pain in pelvis or abdomen during coitus and developed urinary problems. Nearly half of these women have at least once attempted to seek treatment. A majority of them consulted unqualified health personnel such as rural medical practitioners or elderly women of the village. Rarely did they go to primary health center or a qualified doctor. These women opine that unqualified health providers are kind in their approach and it is easy to contact them. The other half of the women who did not seek treatment felt that it would bring disgrace on them if they disclosed their illness.

2.3.4 Fertility and Hysterectomy

Higher number of children, early or later ages of pregnancy and frequent pregnancies are likely to have an impact on the uterus, which in turn may necessitate hysterectomy. Findings reveal that mean number of children ever born per woman who had hysterectomy in the sampled villages is 4 and the corresponding number of children for woman who did not undergo hysterectomy is 2.5. The average gap between two successive pregnancies is lesser for women who had hysterectomy than non-hysterectomy women. An analysis by parity of women reveals that percentage of women going for hysterectomy increases with increasing parity; particularly till third parity. Around 7 percent of women with a single child had hysterectomy; 28 percent with 2 children; 39 percent with 3 children. The remaining 25 percent had 4 or more children. One woman had hysterectomy even though she never had a child of her own.

Sex composition of the surviving children at the time of hysterectomy reveals that a higher percent of the women with two or more children and with a combination of at least a son and a daughter had hysterectomy than those who had children of same sex; relatively fewer women with no sons, i.e. who have only daughters had hysterectomy than those who had at least one son. Around 12 percent of women had Hysterectomy instead of tubectomy (a surgical procedure to make a woman sterile). About 3 percent were advised to undergo hysterectomy as they had a cesarean section and 2 percent were advised for hysterectomy when they had a still-birth.

2.3.5 Health condition prior to hysterectomy

Women were asked to narrate their health status prior to undergoing hysterectomy so as to assess their health condition leading to the surgery. They were asked to recall and narrate what were the initial problems that they had experienced and the data is presented in Table 9 below.

Table.2.9: Health Problems experienced by Women Prior to Hysterectomy

Health problems prior to Hysterectomy	Women (n=132)	
	Percent	Number
Heavy white discharge	65.9	87
Itching or burning due to vaginal discharge	22.7	30
Bad odor in vaginal area due to discharge	15.9	21
Pain in lower abdomen other than the pain during menstrual period	51.5	68
Pain or burning sensation while urinating, or having more frequent or difficult urination	67.4	89
Pain in lower abdomen or vagina during intercourse	20.5	27
Blood after having sex, at times when not menstruating	11.4	15
Prolapsed uterus noticed	12.9	17
Abnormal growth in lower abdomen noticed	16.7	22
Swelling of lower abdomen noticed	19.7	26
Fullness in lower abdomen	31.8	42
Difficulty with excess urination	25.8	34

Most of the women suffered from more than one health problem. Two thirds of the women suffered from white discharge and difficult urination. Half of the women also mentioned of a pain in lower abdomen that is usually not present during menstruation. Nearly one-third of them have noticed fullness of lower abdomen; one-quarter to one-fifth of them complained of difficulty with excess urination, itching or burning due to vaginal discharge, and pain in lower abdomen or vagina during intercourse. Less than twenty percent of women had problems such as any other discharge along with white discharge, noticed swelling of lower abdomen, noticed abnormal growth in lower abdomen, bad odour in vaginal area during discharge, noticed a prolapsed uterus and bleeding after having sex.

Some of the reported symptoms have been grouped to classify them into bio-medically-defined morbidities.

- Prolapse - feeling of something (a mass or swelling) coming from the vagina, or leakage of urine when coughing or sneezing

- Urinary tract infection (UTI), abnormal frequency of urination, with burning sensation while passing urine
- Dyspareunia – pain during intercourse
- Lower reproductive tract infection (LRTI) – white or coloured discharge from the vagina with bad odour, itching or irritation;
- Acute pelvic inflammatory disease (APID) – lower abdominal pain or vaginal discharge with fever;
- Abnormal (dysfunctional) uterine bleeding (DUB) – irregular and unpredictable bleeding, lengthy or heavy menstrual periods;
- Uterine fibroids, as diagnosed by a doctor.

Table.2.10: Morbidities prior to Hysterectomy by Bio-medical Categorization

Biomedical categorization of morbidities	Women suffered	
	Number	Percent
Lower reproductive tract infection	87	65.9
Acute Pelvic Inflammatory Disease	71	53.8
Urinary Tract Infection	57	43.2
Uterine Fibroids	50	37.8
Dyspareunia	27	20.4
Prolapse	17	12.9
Dysfunctional uterine bleeding	15	11.4
Total women	132	100

The bio-medical categorization of morbidities reveals that more than two-thirds of the women were suffering from lower reproductive tract infection (Table 10). More than half of the women were suffering from acute pelvic inflammatory disease; about 43 percent of them suffered from urinary tract infection, 38 percent of the women had growth of uterine fibroids. One fifth of the

women suffered from dyspareunia; around 12 percent each experienced prolapse and dysfunctional uterine bleeding.

2.3.6 Health Care Seeking Behaviour Related to Hysterectomy

Apart from understanding the health status of women prior to hysterectomy, information related to treatment is essential as it helps to identify the processes leading to the surgery. Decisions related to surgery are generally influenced by the advice of the healthcare provider with whom the morbid person interacts. Thus an analysis of details of treatment pattern of the women is carried out in the present study.

Women who realized their health problem were not initially comfortable to go to a doctor because most of these problems are related to '*personal health*'. The following comment reflects their typical attitude towards reproductive health.

“How can we tell in the family the problem with which we are faced? Isn't it a shame to disclose these matters to others? It is better to bear it as far as possible rather than making ourselves shameless”.

When the problem becomes annoying, then they consult a doctor. Additional probing revealed that “going to a doctor” means going to “Registered Medical Practitioners” (RMP). All the RMPs in the study villages are unqualified medical practitioners. The RMPs in the villages have acquired some skills while assisting a doctor and later started treating people by themselves. Women preferred them because of various reasons. One usual comment related to this is:

“Usually women are bound to have certain ‘women’s problems’. We tend to share about the same to our friends/ neighbours. We consult the same person as the other women are doing”.

In addition, the local RMP is easily accessible. In most of the villages a RMP is either a village member or from a neighbouring village. Even if an RMP is not a resident of the village, as he regularly visits the village, women find it convenient to go to him rather than traveling to a distance to reach a health facility.

In general, women are reluctant to visit the PHCs, as most felt that the concerned doctor did not visit the center regularly. Thus they either meet a paramedical person or return home without having a check-up. A few women also mentioned that the paramedical staff uses offensive language when women approach them with gynaecological problems. In contrast, the RMP appears to have better knowledge, skills and attitude than the government paramedical staff.

Most importantly, the RMP is much more sensitive to them than the paramedical staff. The RMPs in turn, with or without initial treatment, refer the women to a qualified private practitioner. Only a few have consulted a public paramedical health personnel or a doctor at a primary health center for the illness.

On the contrary those women that did not undergo hysterectomy opine differently. They have primarily emphasized on hygiene and healthy eating habits for maintenance of women's health. Some of the relevant comments related to it are:

“Women need to maintain hygiene, particularly during menstruation. The usual practice during menstruation is to use a cloth, which is reused after a wash. Even though women use detergents they wash the soiled cloth at night and dry them either on bushes or in dark corner of the house. This practice causes illnesses”

“One needs to eat fresh and warm food. The food habits have changed when compared to our previous generation. The food that we eat now has no nutrition as it is produced with lots of inorganic manure and pesticides. Hence we need to choose good food, eat at regular intervals and eat freshly cooked food. This keeps every one healthy”

They are critical about the choosing of a healthcare provider. They opine that for minor ailments like cold, cough or fever the available RMP is acceptable. However for white discharge, they feel that one should either go to a Government Area Hospital situated in the block headquarters or go in for alternative medicine. Some of the women in the FGDs have expressed faith in non-allopathic system of medicine and suggested an ayurvedic doctor in the block headquarters who had been administering alternative treatment that has been effective for many women.

2.3.7 Deciding Factors for Hysterectomy

Even though 54.6 percent of the couples mentioned that they have taken a combined decision to go in for a hysterectomy, it appears that they are actually led by the opinion of the social set-up in which they are placed. Often it is the first person on contact i.e. RMP, the medical practitioner whom they have approached and the friend/neighbour who had a hysterectomy.

In the study villages, the doctor/surgeon whom the women contacted did not consult with the women about their health condition. The health personnel often convinced the women that they are making right decision in favour of surgery for the improvement of women's health. In 13.7 percent of cases the qualified private medical practitioner insisted that the woman go in for an immediate surgery. In the remaining cases, the doctor emphasized that hysterectomy is the solution to their ill health.

Table No. 2.11.

Particulars related to health prior to hysterectomy and after surgery	Percent of Women
Consulted any healthcare provider for the health problems experienced by the woman prior to Hysterectomy	78.8
Whom did the women consult first for health complications <ul style="list-style-type: none"> ▪ PHC Doctor ▪ Private Doctor ▪ RMP 	10.6 24.8 64.6
Did the Health care provider explain the reasons for illness <ul style="list-style-type: none"> ▪ No 	100
What did the health care provider advice <ul style="list-style-type: none"> ▪ Threat to life if Hysterectomy is not performed ▪ All health problems will subside by Hysterectomy 	13.7 65.1
Took treatment prior to Hysterectomy <ul style="list-style-type: none"> ▪ Yes ▪ No 	68.3 31.7
Whom did the women approach for treatment <u>First time</u> <ul style="list-style-type: none"> ▪ PHC Doctor/ Govt. hospital ▪ Private Doctor ▪ RMP <u>Second time</u> <ul style="list-style-type: none"> ▪ PHC Doctor/ Govt. hospital ▪ Private Doctor ▪ RMP 	6.8 57.7 4.8 1.0 23.1 1.9
Prior to Surgery did the health care provider brief the women about benefits/consequences of surgery? <ul style="list-style-type: none"> ▪ Yes ▪ No 	54.5 45.5
What did the health care provider brief you about benefits/consequences of surgery <ul style="list-style-type: none"> ▪ If surgery not performed immediately it would be threat to life ▪ Would be cured from health problems after Hysterectomy 	13.7 40.8
Persons who motivated the women to go in for Hysterectomy <ul style="list-style-type: none"> ▪ Husband ▪ Self ▪ Both ▪ Mother/ Mother-in-law ▪ Government Doctor ▪ Private Doctor ▪ RMP 	26.5 10.3 60.6 06.1 02.4 65.3 83.8

The study also reveals that the women too do not expect the doctor to explain their situation nor felt the need to know about the causative factors. Hence none of the women were provided nor have they asked for alternate methods of treatment. A majority of the women opined that hysterectomy would bring a solution to their ill health.

2.3.8 The Financial Implications

Despite a total conviction that surgery would bring miraculous change in their health status, 61 percent of women preferred to undergo medication for few months prior to the surgery, as they were not financially equipped for an immediate surgery. The average annual income of the

families engaged in labour is Rs. 12000/-. Hence most of the families had to find alternate financial sources, where they often end up taking a loan from village money-lenders. This in turn puts them into a debt trap on an average for a period of 5 to 10 years. Hence some of the families prefer to go for a non-surgical treatment for some period. Even this treatment is no less expensive given their financial position. The median amount of money spent by women towards treatment prior to the surgery is around Rs.3000/-.

A majority of these women had hysterectomy at a private hospital (84.8 percent). However, comparatively speaking, women with higher age and parity and those who belong to scheduled and backward castes opted for a government hospital. In a majority of the cases where women had hysterectomy at a private hospital, though the woman's husband/head of the household decided the hospital, it was actually influenced by non-family members. A few women opted for a particular hospital after being referred to them by their neighbour/friend who in turn had such a surgery. In a majority of cases, the healthcare provider whom women had first contacted had a greater influence on selection of the hospital. Since many of these women have consulted a RMP, they preferred the hospital referred by him. Women and her family members believe that the personal relationship between the RMP and the doctor will ensure better care for them. Similarly RMPs believe that they are doing a favour to women by referring them to a familiar hospital. Though the RMPs did admit that they are paid an honorarium for referring a patient to a hospital, they insist that their referral is well intentioned. The average cost incurred for the surgery is Rs. 20,220/- in the study sample.

2.3.9 Post-operation Experience

Subsequent to the hysterectomy, women stayed in the hospital for 11 days on an average. Around 23 percent of the women stated that along with hysterectomy, ovaries were also removed. Other women were ignorant about it.

Any surgery carried out on a person is to improve her health from the prior morbid state. Fifty three percent of women agreed that there is a relief from prior health problems. Even though many have agreed that their prior health problems have been addressed after the surgery, almost 47 percent of them have admitted that they are suffering from other complications. Further, 25% percent of the women are still suffering from abdominal pain, the problem that the surgery is supposed to have addressed. 5 percent of women are suffering from gynaecological problems such as white discharge and coloured discharge. Fifteen percent reported that they are suffering from non-gynecological problems such as weakness, body ache, backache,

stomachache, indigestion etc. Given their present health status, nearly 40 percent of the women categorically stated that they would never advise any other woman to go for hysterectomy.

2.3.10 Discussion and Summary

To understand the conditions leading to hysterectomy, it is necessary to analyse from a bio-medical point of view. Medically speaking, the specified morbidities as per primary data gathered do not suggest a need for hysterectomy as the necessary solution for all women.

At the Patient's level: Medically, there is no correlation between fertility and hysterectomy and unlike sterilization hysterectomy is not a surgery by choice. However, examining the association between hysterectomy vis-à-vis the sex composition of the living children, the findings raise suspicion on the decision leading to the surgery. Perceptions of men and women as disclosed during focus group discussions revealed that a majority of women as well as men and the local RMPs opine that the role of reproductive organ diminishes once the desired fertility is attained. Most of these women and men also confess that there is no necessity to retain the reproductive organ if desired number and sex of children are born. Some of the women do not differentiate between tubectomy and hysterectomy.

The statistical findings have shown that there is a strong association between *women's attitude to oblige husbands' sexual desires* and various morbidities. Medically speaking once again, there is no association between women's obliging attitude and hysterectomy. The likely possibility is that the gendered conditioning of a 'perfect wife' plays a role in her coitus freedom/behaviour and this is likely to lead to certain infections. If it is not treated in a timely fashion, it may further lead to 'acute pelvic inflammatory disease' or 'dyspareunia' and 'urinary tract infections'.

In addition, low bargaining position to protect their own sexual health by some of the women when they are very much aware that their husbands have more than one sexual partner has a bearing on their gynaecological ill-health. Fear of violence and divorce weakened these women's bargaining position. In the presence of illness, women also viewed hysterectomy could be a solution to maintain better marital relationship with husbands by gaining the ability to participate in coitus. Women anticipated that 'obliging' the husband's sexual desires may decrease violence between the couple, which in turn may improve husband-wife relations. Men on the other hand are insensitive towards women's health. They opine that women are susceptible to ill health of one kind or the other, thus it is better to opt for 'permanent' solution.

The statistical findings have revealed that literacy levels have shown a significant negative association to 'Acute inflammatory diseases'. In other words more illiterate women suffered from gynaecological ill-health than literate women in the villages. Findings of focus group discussions revealed that illiterate women follow poor menstrual hygiene compared to the literates, which in turn may lead to lower reproductive tract infection. Untreated lower reproductive tract infection may lead to acute pelvic inflammatory infection.

Studies have shown that utilization of health services is affected by multitude of factors including availability, distance, cost and quality of services, socioeconomic factors and personal health beliefs. In the context of women, Chatterjee (1990) posited the role of need, permission, ability and availability. In the Indian context, the situation is further complicated by women's perception of illness, which is affected by women's cultural conditioning to tolerate suffering. In the present study as well, women did not disclose and seek timely care during initial stages of gynaecological ill health. Low perceptions for the need for treatment and women's gendered conditioning to tolerate suffering, whether it be of urinary infection or reproductive tract infection, has delayed in seeking timely care, which in turn might have amplified the gynaecological illness. Prior to marriage women were required to take permission from their parents to seek care. Some of the parents did not like to acknowledge the existing reproductive health disorders of a daughter prior to marriage, as it might have an adverse effect on the prospects of her marriage. This is especially in a society where marriage is considered important and having an unmarried daughter after certain age brings disrespect to parents, especially the fathers. With already existing social pressures of dowry, fathers prefer to marry off their daughters with out an acknowledgement of any ill health. After marriage women themselves delayed in seeking treatment as perceived need was low.

At the healthcare facility and with the RMPs: Even when women had come forward to utilize reproductive health services at a public health center, non-availability of a lady doctor, gender-insensitive approach of health staff towards patient's privacy and rude behaviour of health staff has de-motivated women to seek health care from the public health centers. Women assessed quality of care largely in terms of behaviour of health personnel rather than the actual treatment. This is particularly if they are suffering from reproductive health problems. Thus the women preferred to consult some one 'humane' and easier to access rather than for the health provider's qualification. Consequently the first person that women approached for a treatment was RMP. On the other hand a majority of the RMPs seem to be insensitive towards women's health in a real sense.

Again the 'interest' taken by RMPs in suggesting a surgeon/hospital needs to be understood with prudence. Though the RMPs have mentioned that they are helping the women by referring to an efficient surgeon/hospital, the justification of RMPs vis-à-vis the remuneration they receive for referring each case needs a detailed analysis in this aspect. However such an analysis cannot be carried out for the present study for want of more data.

At the private hospitals: The study reveals that a majority of women had the surgery at private hospitals. The findings show that the private practitioners insisted upon and emphasized the need for a surgery. Again the surgeons and other healthcare providers are not interested in briefing either the patients or the family members about the consequences of the surgery or look at alternatives. It reflects the careless attitude of the healthcare providers.

While the women and their families go with a pre-conceived conviction about hysterectomies, the reiteration of the surgeon with or without prior diagnostic tests raised no doubts among the women regarding the need for surgery. It is also apparent that the patients were not told about the exact nature of treatment – for instance, that ovaries were also being removed.

Analysis also reveals that no follow up procedures were adopted. The costs incurred by poor families in these unindicated hysterectomies are also the earnings of the private practitioner.

2. 4 Hysterectomy – Ethical Considerations

The health care system is rapidly changing in India today. The speedy penetration of market-based approaches and the establishment of neo-liberal mindset as the dominant framework in policy-making resulted in unprecedented waves of privatization of the Indian economy from the early 1990s.

There is a rapid and unregulated development of corporate hospitals combined with the progressive decline of public hospitals. Moreover, the poor implementation and the absence of correlative reform of the regulatory frames left the sector without much control over the practitioner and the medical practice itself. Scandals of corruption, sanitary crisis and human rights violation frequently break out in national newspapers.

Increasingly discredited and distrusted by the Indian society, the medical community is facing a costly crisis of authority, which in exceptional instances even led to practitioners' murder by their own dissatisfied patients. The medical community struggles to address the harsh public criticism of the exploding cases of ethical misconduct riddling medical practice in India and in fact,

remains rather apathetic. Indeed, while neither the central nor the state government promoted regulation of healthcare, the medical community which has its own regulatory bodies, timidly hit back. The Medical Council of India, the highest authority in charge of promulgating and implementing/enforcing legal and ethical guidelines, issued a new code of ethical regulation in 2002, as a revision of the earlier one, formulated 40 years ago.

The credibility of the new guidelines is however compromised by the successive scandals of corruptions that involved some of the members of MCI. Extensively debated by Indian media at large, it appears to be also critiqued by a section of the medical community itself. The MCI understanding, conception and articulation of ethical guidelines and the practitioner's responsibility toward patients as well as to society at large have been intensively questioned for the last 10 years. Doctors seem to distance themselves from the narrow, vague and somehow obsolete ethical framework established by medical councils. It appears that the physician's community is engaged in a dissenting re-conceptualization and re-actualization from below of the nature, aim and thrust of medical ethics. They question the doctor's medical responsibility as being too narrow and rather voice the need for a broader socially-concerned "responsibilization". Clearly, this differentiation has progressively set apart the medical community and its representative and regulatory bodies, leaving two sets of medical ethics and social responsibility, one unofficial competing for mainstreaming and improving the existing (official) one/framework. Thus understanding the ethics, or rather the lack of ethics, in the medical practice in rural areas should encompass the formal as well as the informal, yet seemingly pervasive, ethical guidelines operating side by side within the healthcare system in India. Along with the analysis of the existing official guidelines, the understanding of the ongoing processes of re-conceptualization of medical ethics will thus, allow to generate a more intricate contextual understanding of the ethical soundness of the set of discourse and practices surrounding hysterectomy as a recurrent practice in Medak to treat basic gynecological problems.

In the West, the medical community has been engaged in the slow and difficult exercise of self-reflection for the last 20 to 30 years. The profusion of public scandals of mistreatment of patient, harmful and cruel medical procedure, torture (especially in geriatrics and psychiatry) throughout the 1960s and 1970s discredited the medical profession. The social discontent led to internal discussion about the working of a system which was erected as a model for human welfare through the post-WWII era. Indeed, the knowledge frontier was constantly outperformed by massive breakthroughs in biomedical science and the generalization of groundbreaking therapies.

In the 1980s the internal debates took a heated turn with the members of the medical profession themselves publishing alarming accounts/research depicting the dehumanizing face of the medical practice. “*The Silent World of Doctor and Patient*”, written by a Yale doctor and ethicist Jay Katz came out in 1984 severely criticizing the traditional pattern of medical decision making. Following this, new avenues for reflections on medical practice opened up – reflections on the nature of the medical practice, the doctor’s figure and authority. This led to a process of reconstruction of medical discourse, practices and institutions as well as public self representation. Ethical obligations are also revisited and reformulated in this process.

In line with these western trends, doctors in India too engaged in similar introspection. Internal debates have emerged in the last decade about questions regarding the relationship between medicine and society, doctor’s purpose, the nature of the medical practice, the knowledge ground on which the latter is constructed, the relationship with the patient and the patient himself/herself. Interestingly, practice and ethics tend to be interwoven and interdependently understood. The medical practice turns out to favor ethical practice and allow the doctor to sort out otherwise inextricable ethical dilemmas.

Alongside the attempt to endorse ethically sound, non violent practices within the discipline (of modern medicine), attempts are also made to explore alternative ethical and medical systems. Though relatively limited, this intellectual exercise is nonetheless significant and bears signs of promising developments in the recent past. Such an exercise has resulted in mainstreaming alternative systems such as Ayurveda in the Indian medical scenario, with some physicians adopting a multidisciplinary approach to medicine.

2.4.1 Ethical Obligation and Social Responsibility

Ethical systems are normative systems establishing the do’s and don’ts of a professional practice. As W. F. May puts it “ethics supplies a type of lens. Ethics supplies a type of corrective lens. Ethics relies heavily on the distinction between what is and what ought to be”. Not neutral, unlike what was until recently commonly believed by practitioners and lay people, modern medical ethics, as much as the medical practice, is historically and socially shaped by specific cultural and social arrangements. It reflects certain perceptions and conceptions of the world. As a mode of understanding, modern medicine became naturalized by its very actors and institutions and thus established as the only “scientific” truth about health and only tool for human welfare. As for other by-products of western modernity (i.e. Science and Technology and the sub-disciplines therein), the conventional medical ethical framework reflects an

unconditional commitment to progress through exact, rational understanding, expertise and domination of nature.

The Hippocratic oath continues to be the pillar of medical ethics; it structured and still structures ethics, albeit less significantly as it has been substituted or complemented by new ethical guidelines. It establishes the supremacy of the doctor. However, the ubiquity of the doctor and the silence of the patient, as we have seen, turned to be problematic. It provoked in the West as well as in the non-West new reflections about the nature of the ethical obligation of the medical professional. It is a process that as we will see in the case of India, elicited the recognition of the patient as an active participant in the medical encounter. And, with new challenges and new dilemmas (sex selection, HIV/AIDS treatment), the need for a new framework of ethics became imperative.

2.4.2 Ethical Standards

The Medical Council of India/ICMR issued new ethical guidelines in 2002 to replace the former framework established as far as 40 years back. Elaborated by the MCI, it prevails throughout India and structures the practice of all medical personnel involved in healthcare. As regulating the practice, the code defines the doctors' dos and don'ts.

The code reasserts the specific commitment of the practitioner to "render service to humanity" unconditionally to which personal gain is a subordinate consideration. The physician can refuse to treat patients; however s/he has the obligation to attend cases of emergency. The respect for life and the dedication to the patient's beneficence is thus one of the central ethical obligations of the doctors towards the patient and society.

The code also intends to reflect upon new concerns. Ethical issues, for instance, related to sex determination tests and the practice of referral received particular attention from the MCI in this new code. Some highlights:

- Following a decade-long public scandal, the MCI through Section 7.6 officially denounces the unethical misuse of pre-natal technologies. "On no account shall sex determination tests be undertaken with the intent to terminate the life of a female foetus developing in her mother's womb [...]"
- The same is noticeable regarding the regulation of referral: referring patient to other doctors or from generalist to a specialist as well as advising a colleague for second

opinion have been since the 1990s sites of malpractice and corruption ('referral commissions', 'cut'). The code intends to regulate this medically valuable practice by elaborating traceability mechanisms (systematic medical records; referral notes) thus delineating the practitioner's responsibility.

- In the same vein, some dimensions of the code testify to a certain mainstreaming of the comprehensive, holistic and patient-centred perspective on medicine intensively discussed and theorized by the community of authors. Thus, for instance, the patient emerged as an actor of medical decision-making having *rights such as medical decision (consent) or being provided with complete, honest and graspable information*. The section on human rights/torture, though limited, is also an acknowledgement of the profession's entrenchment in the social world and the societal thrust of its practice.

However, the code of ethics' regulation remains firmly grounded in a conventional perspective on medicine where the patient remains a passive recipient, as we can see when it comes to the issue of consent. Patient consent is acknowledged as a crucial issue of the medical practice with the obligation to obtain a written consent (section 7.18 + section 7.219). However it is rather limited, vague and seemingly easy to overrule. The code of ethics regulation states that the Patient's Consent (and correlative right to confidentiality) can be overridden by the "laws of the State" as a "duty to society" in cases of severe health/sanitary threat to the population. Moreover, the patient's 'privacy' is ill-defined and allows the doctor to systematically dismiss it as the code also states: "the doctor should ensure himself that the patient, his relatives or his responsible friends have such knowledge of the patient's condition as will serve the best interests of the patient and the family".

In this way, the code of ethics perpetuate an intrusive and invasive attitude of the medical experts, negating the patient's intimacy and reestablishes the patient as passive and silent in the medical process by negating her/his right to decide and to confidentiality.

9 Though with the existing formulation, the achievement of the written consent is misleading and may ultimately allow the practitioner to override the patient's opinion: "to obtain in writing the consent from the husband or wife, parent or guardian in the case of minor... + other condition and process" (7.21: no in fertilization, in vitro, insemination shall be undertaken without informed consent.).

2.4.3 Ethical Standard – Informed Consent

The ICMR guidelines acknowledge the patient's consent as a necessary prerequisite to the medical process. However, consent is not systematically required as it is formulated in the case of redesign of treatment. Defined as a contract, consent is defined as the patient's written agreement with the terms of the medical process displayed by the physicians. Though innovative, as it acknowledges the patient's voice in the medical process, the way consent is conceptualized in the ICMR guidelines still entails a conventional top-down understanding of the doctor-patient relationship.

Consent is “not a ‘one-off’ event of signatures on paper” and not a submission of the patient to a particular treatment but rather a process of communication. Consent is not reachable *per se* and requires as a pre-requisite the construction of the patient competence, that is, her/his capacity to decide. The consent is then perceived as a proactive process empowering the patient to consciously decide on what s/he considers best. Thus, consent is “a process of communication requiring the fulfillment of certain established elements like competence, sufficient disclosure, understanding and volunteering”.

Adopting a holistic, patient-centered approach on medical processes, authors in the Indian Journal of Medical Ethics (IJME) have revisited what constitutes an ethically acceptable consent. IJME conceptualizes consent as a process, a dialogue, as requiring translation, with definite terms and constructing autonomy.

- Consent is seen as process of communication.
- Consent means a two way dialogue between doctor and patient as often as needed and whenever possible, a respectful exchange of views and it must rest on a respectful and compassionate relationship with a fellow human being.
- Translation in consent means a process of communication requiring the fulfillment of certain established elements like competence, sufficient disclosure, understanding and volunteering
- The terms of consent refer to extending the domains explored in the construction of informed consent – financial resources, family dynamics etc. There is the need to display full information to the patient.

2.4.4 Observance of Ethics in the case of Unindicated Hysterectomy

If we recall the data presented in chapters 2 and 3, we can see quite clearly that there has been little adherence to the ethical standards laid out above. The following facts bear this out.

- A significant percentage of women had been referred to the private hospitals by the RMPs who received a “honorarium” as payment for their referral services
- A significant percentage of women said that there had been limited dialogue regarding their illness and different options were not offered to them
- A significant percentage of women had hysterectomies done with no proper procedures and protocols
- A significant percentage of women had no written case histories which is required in the case of follow up
- There appears to be blatant commercialization of medicine in the case of hysterectomy given the amount that is required to be spent on the surgery and post operative care
- There was little consideration to the terms of consent given that the majority of women were from the lower income group and illiterate – there was no attempt to probe into the financial situation and make it easier. In fact the patients had to incur debts in order to meet the surgery expenses
- There appears to have been little consideration given to the beneficence factor, as clinical investigations of the hysterectomised women show a negative impact on their health.

However, that humane practice of medicine is possible is evident in the practice of Dr Kameshwari of *Life*-HRG who approaches patients holistically and redefines the practitioner-patient relationship. As the next chapter would show, *Life*-HRG’s work takes into account the social, economic, and health conditions of the woman before prescribing appropriate treatment.

2.4.5. Ethical Practice in Life-HRG

Life-Health Reinforcement Group (HRG) is a Non-Governmental Organization established in the year 1999 by a group of social scientists and medical doctors. Since inception, the organization has been striving to address issues around inaccessibility to basic amenities such as food & health and how this can be realized as a right. Through its urban and rural clinics and participation in disaster relief work, the organization has gained valuable learnings and experiences. Social & medical experiments lead to grounding an approach which looks at food as medicine, as a viable alternative for enhancing health of all citizens.

The work of *Life*-HRG, even as it provides a contrast to the violence of medical practice freed of any ethical control mechanisms as the many cases of hysterectomy studied in this case study have illustrated, showcases the interface of indigenous medical knowledge system with modern

medical knowledge as an alternative approach to promote non-violent medical solutions to the gynecology problems faced by women in rural areas.

It also shows that alternatives can be endorsed with the frame of modern medicine by practitioners by:

- Re-establishing a "humane practice";
- Reconstructing ethical standards and implementing efficient mechanisms and frameworks;
- Re-conceptualizing the medical practice, understanding of health, disease and illness, medical authority and responsibility of the practitioner and the relationship between medicine and society.

In the case of Life-HRG, the creation of an interface between modern medical expertise and indigenous medical knowledge(s) is enabled by a prior or correlative critical stand towards modern medicine. For instance, Dr. Prakash's and Dr. Kameswari's interest in food as medicine and indigenous knowledge about nutrition is correlative to a prior conscious dissociation from mainstream modern medicine, that is, the ruling worldviews, understanding, authority construction and practice. Indeed both are, for more than 10 years now, in a position of defiance against the institutionalized discourse of modern medicine and the corresponding dominant social arrangement in India. Both expressed and constructed a deep distrust in the institutions of medicine (from fellow practitioners to medical journals) leading them to shape a practice rather autonomous from the healthcare system (e.g. distrust in Indian medical journals, little if no affiliation to medical centers/associations, freelance surgical practice, (almost) complete independence of practice within Life-HRG (the latter being progressively constituted as an alternative medical space for ethical conduct and medical experiments).

Simultaneously, Dr. Kameswari is particularly critical of the core of her expertise (obstetrics and gynecology) aware of its limitations and the potential harm it can do to people. Kameswari's uncertainty about the acquired expertise in obstetrics and awareness of the vulnerability/fallibility of her practice seemed to be the major incentive to open up her western medical practitioner's mind to indigenous knowledge.

Dr Kameswari's personal critical engagement with modern obstetric knowledge, questioning its universality, infallible veracity and capacity to bring good to people is a pre-requisite to the

exploration and internalization of indigenous knowledge practice (this is apparent in her internalization of looking at the 'system as a whole'; that is, not only using food as medicine but fostering the rehabilitation of beneficent and yet defeated sustainable agricultural practices). She is also careful to avoid idealization of the past in the process. Thus, understanding Kameswari's exploration of alternative health/food knowledge system as an alternative to hysterectomy cannot be fully understood if the correlative process of re-conceptualization of 'medicine as a whole' is not addressed.

The earlier chapters dealt with the incidence of unindicated hysterectomies in one block of Medak district in Andhra Pradesh and explored the social factors and the clinical practice around this phenomenon. Dr Kameshwari's approach differs radically from those practitioners described in Chapters 2 and 3.

As has been seen in those chapters, some common symptoms for which women seek medical help and are routinely advised hysterectomy are:

- Pain in the abdomen and white discharge
- Spotting/irregular menstruation/heavy flow
- Genital prolapse
- Uterine fibroids

Dr Kameshwari has dealt with each of the above complaints and obtained positive results through non-surgical treatment. A few such cases – how they were dealt with and the results – are presented below, to establish that an alternative, non-violent and ethical approach is indeed possible.

A. Pain in the abdomen and white discharge:

Patient - 30 year old woman belonging to the lower income group.

Symptoms – Tenderness in the lower abdomen, white discharge with foul smell, backache, abdominal pain aggravated during period. These are typical features of Pelvic Inflammatory Disease which in this particular patient's case was a result of malnourishment, poor hygiene, early coitus and STD.

Treatment – 14 days antibiotics for both wife and husband (doxycylin, metronidazole with an antacid). In addition a pap smear was done and cryocautery for cervical erosion. In addition to

these medical procedures, counselling was given to husband and wife regarding the need for abstinence and personal hygiene. The patient was also advised to take iron calcium supplement. The patient was also told that there is likely to be white discharge due to the cryocautery but this is different from pathological discharge. The total cost of the treatment was Rs 600 and the patient is not likely to require any intervention for the next 3 -5 years, as experience with several other women shows.

The socioeconomic status of the patient is important as in the case of those in the higher socioeconomic group, with better education, personal hygiene and resources, the likelihood of recurrence of the illness is minimal.

Case 1: Patient: 28 year old urban woman with 2 children.

Complaint: Irregular periods over the last 5 years and at present, heavy periods with clots. Monthly menstrual periods lasted for 28 days. As a result, the woman is severely anemic. Other doctors had suggested hysterectomy and blood transfusion.

Treatment: Followed protocols. Ultrasound of abdomen and uterus. This showed endometrial thickness of 17mm and the ovaries as polycystic. Next, the smallest possible disposable suction canulas were used to do outpatient biopsy for endometrial sample to rule out endometrial cancers which can occur very early in polycystic ovarian syndrome. The histology exam report showed simple hyperplasia. Since the patient showed all markers of insulin resistance, medication was finalized in consultation with the endocrinologist. Diabetic medicine (pioglitazone – 15mg) and progesterone was prescribed to control the bleeding. Given the severe anemia – iron supplements were prescribed both in tablet form and in the diet.

B. Response: The treatment began in December 2009 and the February 2010 menstrual cycle shows a return to normalcy. The patient is under observation for the next 9 months.

Case 2: Patient – 48 year old urban woman.

Complaint – Severe bleeding, anemic. She had already had a blood transfusion and D&C prior to consulting Dr Kameshwari. Hysterectomy was advised by other doctors.

Treatment – As with the earlier case, this too was a case of simple hyperplasia which can be treated medically. A thyroid scan was done to rule hypothyroidism. Counselling – rest, iron tablets, iron rich diet. In addition, suggested diet restrictions and the patient was asked to avoid processed foods to avoid xenoestrogens. Exercises were suggested for the patient to lose abdominal fat to control extraglandular production of estrogen.

C. Genital prolapse:

Genital prolapse in women in the reproductive age group is different from that in older women. In older women, prolapse occurs because of loss of muscle tone because of decreased estrogen production. In younger women, prolapse is mainly because of early bearing down during delivery, which causes laxity of ligaments and pelvic floor. In younger women hysterectomy is not necessary; this can be built with Kiegel's exercises which build muscle tone.

The vaginal walls can be repaired through these exercises without removing the uterus. Dr Kameshwari has prescribed this successfully to young women who came to her with genital prolapse. In one case, an instance of 2nd degree prolapse was changed to 1st degree prolapse.

D. Uterine fibroids:

Case 3 Patient: 45 year old woman

Complaint: Feeling of lump in the lower abdomen. Found a 9x8cms subserol fibroid. The fibroid was however a sessile fibroid, therefore there was no danger of torsion, so no severe emergency pain.

Treatment: Since she is in peri-menopausal stage and has a family history of menopause at 45 – 48 years, she was advised to wait as fibroids can reduce in size in the postmenopausal years. In the meantime she was counselled for change in diet and taught to monitor for emergency signs.

The above case studies clearly illustrate how the same symptoms can be treated very differently and humanely taking the patient and the patient's family into confidence.

2.5 Conclusions

The main objective of this case study was to explore the ethics of medical practice using instances of unindicated hysterectomy as a case in point. It was clear from the data collected and analysed for this paper that women were being actively pushed towards unneeded hysterectomies especially by private medical practitioners along with RMPs in the villages and the same was increasing potential risks for these young women. Ethical considerations which require alternative treatment options, clear consultations with the patients and informed consent to be obtained, follow up procedures taken up etc., were clearly missing in the case of these young women who got hysterectomised.

In exploring the reasons for the high prevalence of hysterectomy in Andhra Pradesh, the case study attempted to analyze the doctor-patient relationship before and after hysterectomy. There is a clear case for the need for a meaningful interaction between the patient (lay person) and the doctor (the expert) – this is crucial if the doctor is to engage in critical self-reflection and to actively seek to enhance his/her expertise through dialogue with other non-conventional experts. This paper points to the violence perpetrated by “experts” on the general public and demonstrates the need for a new social contract between science and society that will take into account the marginalized people who have not benefited and in fact suffered from this kind of practice of science and technology. A new social contract would take into account the well being of the women and engage in meaningful interaction with them to determine the right/most

appropriate solution. In doing this, medical practitioners are compelled to look to other non conventional systems of expertise to deal with the symptoms and come up with sustainable solutions.

While analyzing the clinical and social data that was collected as part of this case study, certain questions have emerged. These questions are related to the way in which medicine is being currently practiced and the violation of ethics which is either deliberate or due to lack of knowledge. The study also throws up questions regarding the way in which women's health is viewed and questions the current health policies vis-a-vis women's health.

The case study brought to light the question of responsibility on the part of the 'expert'. The medical practitioner has the responsibility to

Use knowledge to further practice

Gather knowledge in the process of practice

Generate a knowledge base

Any practice involves the production of knowledge. In this production of knowledge within the medical practice, there is the need for confluence of both the social and medical aspects of the patient and the need to redefine the relationship between the doctor and patient. Any treatment without taking into account the social background of the patient could lead to violence. The modern conception of the human body as a machine and increasingly specialized knowledge of certain parts of the human body leads to the treatment of those parts with little or no understanding of the human body as a whole.

The present case study raises the following questions on the practice of medicine:

Is the approach to patients becoming more mechanical and therefore less humane?

Is the patient viewed solely as a machine or as a human being situated in a social milieu that contributes to her problems and well being?

Are the female reproductive organs expendable once their reproductive function is served?

Is the current body of knowledge vis-a-vis the human body and the role of each organ in the overall wellbeing of the human being adequate?

If current day practitioners are to add to the body of knowledge what should they do differently?

Should there be a shift in the relationship between doctor and patient to that of increased

equality and dialogue vis-a-vis an expert-layman relationship? Should the doctor view the patient as an important contributor to the body of medical knowledge?

The clinical analysis of the hysterectomized patients shows that there appears to be a gap in the body of knowledge regarding the after-effects of hysterectomy on young women. It is clear from the examinations done that the young women do suffer from a host of problems that typically occur later in the women's life. Also, there appears to be little follow-up or appropriate life style advice given to the patients after the surgery, along with counseling for the family, particularly the partner. Dr Kameshwari's practice illustrates very clearly that it is essential to understand the factors that have led to the original complaints and to decide the appropriate treatment which includes both mainstream medical intervention and lifestyle changes such as food intake and exercises, rather than deciding that surgery is the best option. This leads to the questions

Do medical practitioners ensure that the patient has full and accurate information regarding her condition before deciding on surgery?

Do medical practitioners have full and accurate information regarding the consequences of hysterectomy and alternative treatments?

Where is the gap – is it in knowledge or in practice? If in knowledge, then that to a certain extent absolves the doctor, but if in practice, then it is a matter of violation of the rights of the patient and disregard for medical ethics?

Have technological advances and subsequent easy surgical procedures led to the overuse of technology to “fix” problems on a short term?

Have government sponsored health schemes, such as the Arogyasri in Andhra Pradesh, made it easier for hospitals and doctors to offer the option of surgery more widely than before?

Health policies targeting women are largely focused on the reproductive function of women. They do not take into account the fact that the uterus requires care beyond child birth and has a function within the human body that is not limited to mere reproduction. Rather women's health policies appear to ride on population policies and there seems to be a direct link between population and women's health. If women's health is to be dealt with in an ethical manner, there needs to be a delink between population and reproductive health and reproductive health needs to be seen as one of the women's right to health. The social analysis of the hysterectomized women shows that women who had early hysterectomies were largely from the lower income group and several factors seem to have contributed to the gynecological complaints – factors such as early marriage, poor nutrition, spousal relations, etc. Women's health is therefore not

solely a physical condition, but is also influenced by social factors – an understanding of which is essential if one is to ensure complete treatment. If early hysterectomies are to be prevented it is essential that medical practitioners are sensitive to the social milieu in which the woman is situated.

In exploring the plurality of expertise, this paper asks for exploration of alternatives within the medical system and appeals to the experts to not be swayed by technology. It asks for a return to an interactive system of medicine where treatment is based on a sound understanding of the patient as part of a social system that can only be obtained through interaction. The case study also asks for a system of medicine where both the doctor and patient, along with other experts, are jointly concerned and responsible for the sustainable well-being of the patient.

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3. SUSTAINABILITY AND PLURALITY IN THE BUILT ENVIRONMENT: A CASE STUDY OF RECONSTRUCTION

Radha Kunke, Architecture and Development (A&D) and John D Souza, Centre for Education and Documentation (CED) rkunke@gmail.com , john@doccentre.net

3.1 The Case-Study and its methodology

Our Built Environment (BE) can be seen as a symbol of the current paradigm of development involving control over knowledge and resources. This field, regarded as highly specialized, has contributed substantially to environmental damage, furthering of social inequities and has remained the exclusive domain of a few, even as a variety of structures have been put up over the centuries along with many innovations by human civilizations, and hence becomes necessary to study in the context of ethics in science & technology.

Post-disaster the built environment assumes the form of reconstruction where some of these dimensions are enhanced within a narrow bandwidth of space, time and resources. Large scale disasters impact not only the homes and livelihoods of people but destroy basic services and infrastructure – power, water, transport and communications, public buildings and monuments, livelihoods, neighbourhood communities, governance systems etc. A response to the usual scale and extent of destruction requires responsibilities, co-ordination between different sectors, materials, equipment, skills.

A combination of the current development paradigm and the scale of such destruction and immediate need for re-building bring in the inevitable combine of the expert, the government and the market into the arena of reconstruction; and one sees that as in normal times, the decisions of this triad dominate the outcome more often than not. Reconstruction, also, abounds with opportunities as it present a space and opportunity to dismantle that which does not work and put in place with that which is more positive and desirable.

This study takes as its context three major disasters in the last decade in India (the Gujarat earthquake, the Tsunami in Tamil Nadu, and the Kosi floods in Bihar) and seeks to draw observations and learnings from them to examine the opportunities, barriers and challenges to

pluralism, justice and sustainability. It hopes to bring out the factors that are required to be included in any debate on ethics of science & technology, vis-à-vis construction/ re-construction.

This paper sought addresses the following key questions:

What are the dominant, alternative/appropriate technological practices being used that impact sustainability, plurality, community participation and decision making during reconstruction?

What are the major factors that dictate the choices of approaches and technologies?

How do these technological interventions impact the people at the ground level?

What are the learnings and insights from the field? And how are these being applied and absorbed in the broader policy framework?

These questions are posed particularly in the background reality of people's self-sufficiency in construction and habitat development and management in ordinary times. Though many of these were specialized functions, they were rooted in the community and in the local ecosystem and resources (including knowledge). Modern science, while it has much to offer by way of materials, technologies, comforts and design, also appears to have denigrated local practices, people's methods and environmental understanding to promote alien technologies on a mass scale which is often violent in several ways.

3.1.1 Methodology adopted:

The authors, Radha Kunke and John D'Souza, of the case-study have a background experience in reconstruction, being extensively involved in the post-Tsunami reconstruction in Tamil Nadu from 2005-2008. Architecture & Development (A&D) was extensively involved in the reconstruction of three villages and demonstration of good practices and technologies through construction of common facilities and infrastructure. It was also involved, with Centre for Education & Documentation (CED), in a program for documentation and dissemination of reconstruction processes, issues and approaches to various stakeholders.

Many of the insights and conclusions, hence, come from this background of ground level experience. It is during the reconstruction process in Tamil Nadu that many of questions that the Manifesto has raised with regard to People's knowledge, systems and approaches; influence of S&T on policies & guidelines; and plurality and sustainability in current day reconstruction

technologies vis-à-vis traditional and vernacular approaches, were debated amongst the practitioners as well as with the communities.

The Manifesto hence gave an opportunity to further explore these questions and compare it with approaches in other reconstruction initiatives in other states. Since Ethics in (Re)Construction is not a widely debated topic, the case-study was an opportunity to open the issues for debate. This case-study is based a distillation of ideas, concerns, and lessons from discussions and dialogues with a variety of stakeholders and is not a quantitative analytical exercise.

The first phase of the case-study involved searching for and collecting a variety of existing experiences in reconstruction which included situation analysis, evaluation reports, studies, technical guidelines, policy papers, interviews, dialogues and discussions, and other such secondary data of the three disasters. Information on debates relating to Ethics in (Re)Construction was also researched. A reviewing of the collected material threw up broad answers to the questions being posed by the case-study which gave an overall understanding of the direction the case-study was to take.

The second phase of the case-study involved visiting some of the affected villages in Bihar to gather people's experiences after the August 2008 floods caused by the breach in the Kosi embankments. Besides this, documented experiences from the Tamil Nadu reconstruction were reviewed and personal interviews were carried out where necessary.¹⁰

¹⁰ Villages visited and People interviewed and dialogued with:

Khagariya District, Bihar: Bhiriya: Momni Devi, teacher, Lal Sagar Sada, Rajendra Sada and other villagers, Santosh Ghat: Sooraj Sada and other people of the village, Kodra: Manjo Devi, Jagadami Sada, Rambalak Sada, and other people of the village, Chatar Ghat: Phulo Devi, Champa Devi and Hari Krishna Sada (Deputy Sarpanch), Saharsa District, Bihar, Villages visited:

Kosi embankments at Mahapur Punarvas, Mahapur Punarvas : Indra Dev Singh (Mukhiya), Mahendra Singh, Devendra Singh, Ravindra Kumar Singh Madhepura District, Bihar Ghosala : Dhaniya Devi, Sushil kumar Jorgaama : Mohammed Ganni, Haleema Khanon , Samasthipur District, Bihar Khatuaha : whole village, Ilmas: Mala, Bhavisha, and other people of the village Seetamarhi District, Bihar Ramnagar, Belsund: Prem Shankar Singh Jhopadpatti (rehabilitation village of displaced people due to embankments): whole village Raxia (village within the embankments): Aslam Mohammed and other villagers

Other experiences gathered from visits to and discussions with people of: Kanyakumari District, Tamil Nadu Rajakamangalamthurai : People of the village Veerapakupathy : Illaya Perumal, Geeta, Aanbai Thangavel, Chandran Arunthanganvilai: Prema and other people of the village Nagapattinam District, Tamil Nadu Nayakkarkuppam: people of the village Karaikal, Pondicherry Kottucherryedu Kilinjalmedu Karaikalmedu

Recorded interviews and personal discussions with other individuals Dinesh Kumar Mishra, Engineer and Activist, Bihar Jitendra, Mahavir, and Satyendra of Nav Jagriti, Patna Rajendra Jha of Kosi Seva Sadan, Mahishi, Saharsa District, Bihar Jordi Sanchez-Cuenca, Volunteer Architect, Architecture & Development Mona Anand, Architect, Independent Consultant, Delhi Sandeep Virmani, Architect and Activist, Hunnarshala, Bhuj, Gujarat G.Shankar, Architect, Habitat Technology Group, Trivandrum, Kerala Alok Patnaik, Engineer, UNTRS, Chennai, Tamil Nadu

The third phase involved putting together the learnings from both phases and juxtaposing the theoretical understanding with the people's experiences to arrive at the conclusions of the case-study.

The case-study has used a narrative style giving examples from the field and from the secondary data to support and validate the debate and conclusions.

3.2 Introduction: Built Environment and Reconstruction

Since humans learnt to walk upright, they have constantly engaged with their environment and tried to bring it under control, to serve them and to make their life more comfortable, safe productive and enjoyable. This has remained the single-most reason why we still continue to design and produce tools, modify and manipulate space, plan and shape settlements and cities.

These products and processes of human creation collectively are called the *built environment*. This term is comparatively new, but it describes in one holistic and integrated concept the creative (and not so creative) results of human activity in this arena throughout history.

Reconstruction: *Impetus and impact of rapid development*

Disasters, however 'natural', are profoundly discriminatory. Wherever they hit, pre-existing structures and social conditions determine that some members of the community will be less affected while others will pay a higher price.

The arena of 'Reconstruction' is a microcosm of the construction industry, reflecting and telescoping its processes and impacts in a small time-frame. While restoring basic services and life support infrastructure after a disaster can take a matter of weeks and interim reconstruction can take over a period of 3-5 years, full recovery of the communities can stretch out to 10-15 years.

The questions that emerge during the short-term reconstruction phase are: what has been destroyed? What was there before? What was the culture and ethos of the pre-disaster time? What were the lifestyles and inter-community relationships? What were the dependencies and support systems in the region? Does one try and recreate what was there before or improve on the situation? How does one build back better? Who sets the priorities for recovering communities and how are the needs of poor and vulnerable evaluated and met? How are the needs of the communities valued in relation to the pressing claims of disrupted businesses and industries? Who decides what will be rebuilt where? Who gets displaced when new facilities are

constructed in the name of recovery? How are local communities involved in the reconstruction? What kind construction technologies and techniques used? And so on ...

Besides the social dimensions of such reconstruction and rehabilitation, there are issues relating to the environment. Every post-disaster reconstruction sees rapid and mass construction in a very short duration of time. It means unprecedented consumption of materials of different kinds in a very short time,

The reconstruction of houses in Tamil Nadu alone has meant a consumption of 7.2 million bags of cement, 640 million number of bricks, 24 million kilos of iron/steel, 96 million cubic feet of sand and 24 million cubic feet of aggregate (metal), with a carbon footprint of 595,246 tonnes of CO₂ (6,073,000 GJ * 0.098tCO₂) in a short span of 3 years.

at a rate which may not give enough time for the environment to recover and replenish. In that sense, disasters require reconstruction, reconstruction impacts the environment and environmental degradation makes the vulnerable more vulnerable.

The Gujarat earthquake of 2001 affected 7904 villages in 21 districts of the state's 25 districts. It left 370,000 houses destroyed and an additional 922,000 damaged with a total estimated loss of Rs. 21,262 crores.¹¹

The tsunami of 2004 fully or partially damaged more than 150,000 housing units in the states of Tamil Nadu, Andhra Pradesh, Kerala and Pondicherry causing estimated damages of Rs. 994.0 crore (\$228.5 million).

In Bihar, in August 2008, the flood waters caused damage across 3000 sq km of land area in five districts and about 3,40,000 dwellings were destroyed.

This kind of scale of destruction and consequent reconstruction impacts people's lifestyles, environment, social fabric, not only in the short-term but in the long-term as well. Interventions and approaches introduced during reconstruction stand as examples and eventually get absorbed into the mainstream as practices. In this context, the way in which reconstruction gets implemented raises many questions and debates on issues of plurality, sustainability, justice and equity, which is one of concerns raised in the Manifesto.

¹¹ "The Gujarat Earthquake 2001"; Anil Kkumar Sinha; Asian Disaster Reduction Center;

http://www.adrc.asia/publications/recovery_reports/pdf/Gujarat.pdf

It is also true that questions of justice and equity have been frequently raised and addressed in reconstruction and we shall see how these are addressed (at least on paper and in intention) and how these get implemented.

Sustainability in reconstruction, as a concept, has been recognized by and large in the last few decades, but is not yet a priority. However with the debate on sustainability and environmental issues growing over the years, sustainability is beginning to be seen as an issue that needs to be addressed in reconstruction too.

Plurality, however, has hardly been seen as an aspect that needs to be addressed in reconstruction. Though there have been several debates and interventions on including traditional practices into the norms of reconstruction, plurality and its elimination have rarely been highlighted.

Reconstruction also highlights how people's self-sufficiency within the Built Environment very much exists at the grassroots, but though visible remains unacknowledged. It is also subject to the current paradigm of development, much dependent on the 'Expert' and S&T, that erodes this self-sufficiency and puts People and their futures very much in the hands of few.

3.3 Approaches in Reconstruction

There are several approaches to reconstruction¹² which have been tried out by the government and civil society organisations at different points of times in different combinations. They can be broadly categorized as under:

Cash Approach: Unconditional financial assistance is given without technical support. In this approach, the affected families are given a pre-determined amount as assistance. The decisions of how and what to use the money given is left entirely to the affected family. In this approach, the family can use the money for reviving their livelihood, for reconstruction/ repair of their homes, or even migrating to another place.

Owner driven reconstruction (ODR): In an ODR approach, the affected people are given a combination of cash, materials and technical assistance to repair or rebuild their houses. The

¹² Handbook for Reconstructing after Natural Disasters; www.housingreconstruction.org

people then take up the construction themselves or may hire a contractor/ labourers to execute the job.

ODR is now considered the most empowering and dignified approach for households, as the term “owner” in ODR refers as much to the ownership of the building process as to the ownership of the house. The key difference between this approach and other approaches is that contractors and paid laborers are accountable to the homeowner rather than to an external agency and hence the control of the process and the execution is entirely in the hands of the homeowners.

Community-Driven Reconstruction: Financial and/or material assistance is channeled through community organizations that are actively involved in decision making and in managing reconstruction. CDR entails varying degrees of organized community involvement in the project cycle, generally complemented by the assistance of an agency. The degree of control over reconstruction by the community in CDR projects varies between agencies and from project to project. The agency may take the lead, suggesting housing designs, technologies, and/or materials and delivering construction inputs and training. The agency may also employ skilled and unskilled laborers from the community or facilitate the formation of construction committees. At the other extreme, the community may manage most of the reconstruction process and receive only the support of facilitators (“collective ODR”).

Agency-driven reconstruction in situ: In this approach, a governmental or nongovernmental agency hires one or more contractors (either from the community itself or from outside) to design and build the houses. Design, materials, and expertise are likely to be imported from outside the community. The community may or may not be consulted on certain aspects of the project, such as house designs. House owners may be asked to take over some building tasks, such as curing concrete. Whereas house owners may also hire contractors within the framework of ODR, the principal contractor is accountable to the agency and may be contracted through formal tendering procedures.

Because the reconstruction takes place on the owners’ own land, it gives the homeowner some degree of control over quality, and sometimes the opportunity to participate in specific tasks. During construction, owners may be able to make suggestions to or modify the design. This approach eliminates the hurdle of land acquisition and generally allows the household to know where its house will be located. However, if housing designs are standardized or different from

local designs, it may be difficult to fit the houses into pre-disaster settlement layouts or to modify them later.

Agency-Driven Reconstruction in Relocated Site: In this approach a governmental or nongovernmental agency contracts the construction of houses on a new site, generally with little or no involvement by the community or homeowners. The community, government or agency supporting the reconstruction may purchase the land for the new settlement. Upon completion, the houses may be allotted through a lottery or using criteria defined by the community or the agency, or both.

This approach can lead to the construction of costly, inappropriate housing of poor quality and settlement arrangements that do not meet the socio-cultural and livelihood requirements of the people, causing severe economic consequences and low occupancy rates. The argument that this approach results in higher construction quality is rarely valid, because of poor supervision or the lack of qualified contractors. Moreover, finding an appropriate site can be a major challenge; failing to do so is, in fact, one of the principal reasons for dissatisfaction with this approach.

3.3.1 Comparison of Reconstruction Approaches

Reconstruction approaches can be compared according to the degree of household control, the form of assistance, the role of the actors and where the reconstruction takes place. The factors can be combined in many ways. The following table compares the five approaches discussed in this chapter.

Table.3.1.

Reconstruction approach	Degree of household control	Form of assistance		Role of actors			Location	
		Financial	Technical	Community	Agency	Contractor	<i>In-situ</i>	New site
Cash Approach	Very high	Cash only	None	None	None	Household may hire	Yes	No
Owner-Driven Reconstruction	High	Conditional cash transfer to household	Tech Assistance/ Training of household	None	Project oversight and training	Household may hire	Yes	No
Community-Driven Reconstruction	Medium to high	Transfer to household or community	Tech Assistance/ Training of community and household	Project organization and oversight	Project oversight and training	Community may hire	Yes	No
Agency-Driven Reconstruction <i>in-Situ</i>	Low to medium	Funds handled by agency	Limited or none	Limited	Management of project	Agency hires	Yes	No
Agency-Driven Reconstruction in Relocated Site	Low	Funds handled by agency	Limited or none	Limited	Management of project	Agency hires	No	Yes

3.4. Overview of three disasters: The Context

Three major disasters that have occurred in the last decade and have caused massive destruction to life and property are the Gujarat Earthquake, the Tamil Nadu Tsunami and the Bihar floods. Reconstruction in each of these disasters has been distinctly different with varied impacts on people and environment. And in each of these, the relationship between the ‘citizen’ or even the ‘client’ and the ‘expert’ is brought sharply to the fore; the resulting responses of the local communities as well as the civil society organisations support and articulate the propositions of this case study.

The Gujarat earthquake: was large scale and caused massive destruction. Earthquakes recur infrequently. The reconstruction was a progressive owner driven approach, with choice of building materials and technology firmly in people’s hands. This kind of progressive policy initiatives legitimized traditional and alternative practices and created spaces for people’s knowledge system to be expressed.

The Tamil Nadu tsunami: fairly large scale destruction and highly infrequent occurrence. The Government responded with total control over reconstruction process with little or no choice or

control in people's hands. This approach delegitimized and rejected traditional practices of the people.

The Bihar Kosi floods: large scale massive destruction, recurring annually. Traditional practices are largely prevalent with bamboo and mud as materials used extensively in rural home construction. The government has pushed for a standardized, 'pucca', concrete houses; and has also been steeped in conflicts with the Central Government over funds; delayed reconstruction response has resulted in people going ahead with their own reconstruction.

3.4.1 The Gujarat Earthquake

Gujarat suffered from an earthquake measuring 6.9 on the Richter Scale on January 26, 2001. Over 20,000 people died and about 167,000 people were injured. Nearly one million people were rendered homeless. Over 3,48,000 homes were completely destroyed and 8,44,000 partially damaged. The Government of Gujarat (GoG) set up the Gujarat State Disaster Management Authority (GSDMA) that would implement the reconstruction and rehabilitation, with support from various other agencies in the quake-hit area (ADRC 2001). The rehabilitation/reconstruction effort was the biggest-ever housing program undertaken in the entire world in terms of numbers and geographic area. As part of the reconstruction, 24 villages were fully relocated and 37 were partially relocated.

A systematic public consultation carried out by the NGO network Kutch Nav Nirman Abhiyan in 480 villages revealed that over 90 percent of the Gujarati villagers refused the idea of relocation. For some time the State Government insisted on its approach but when it became clear that relocation was not only opposed by professionals, civil society organizations and the concerned villagers but also unacceptable to the World Bank, it finally abandoned its relocation plans. The Government of Gujarat thus adopted an "owner-driven" reconstruction approach. The approach consisted in offering financial and technical assistance to all those who preferred to undertake reconstruction on their own and did not want relocation and full scale 'adoption' by an external agency. Given the option, 87% of the people opted for financial compensation and to reconstruct their houses on their own¹³.

¹³ "From Gujarat to Tamil Nadu: Owner-driven vs. contractor-driven housing reconstruction in India"; Jennifer Dwyne Barenstein; i-Rec - information and research for reconstruction; <http://www.grif.umontreal.ca/i-Rec.htm>

The different approaches and options given to the people created options to be completely independent and build for themselves, or could engage with an organization which would help and facilitate the building process by providing expertise and guidance, or alternatively they could hand-over the building process completely to someone else – either an NGO or even a contractor. *People made different choices and there were different impacts and satisfaction levels.*

3.4.2 The Tsunami in Tamil Nadu

In December 2004, India experienced the devastating effects of a tsunami, caused by a series of earthquakes in the Bay of Bengal. The earthquakes set off giant tsunami tidal waves of 3-10 meters in height, which hit the southern and eastern coastal areas of India affecting around 2,260 km of the coastal area besides the Andaman & Nicobar Islands.

The government of Tamil Nadu, with assistance from the World Bank, the Asian Development Bank (ADB) and the UN Development Programme (UNDP), developed a comprehensive Emergency Tsunami Reconstruction Project (ETRP). Under the ETRP, the government planned to provide assistance to repair, rebuild or construct 140,000 damaged houses in Tamil Nadu and Pondicherry. NGOs, voluntary organisations and public and private sector enterprises were invited to 'adopt' villages for reconstruction.

The government announced its reconstruction policy in January 2005; housing reconstruction was to be either supported through financial assistance from the government or to be ensured through public-private partnership, i.e. through the support of civil society organisations. Once the government realized that there were sufficient non-governmental agencies and funds to ensure housing reconstruction it withdrew from its offer of financial assistance and handed over the reconstruction task to NGOs.

Tamil Nadu's initial rehabilitation policy entailed permanent relocation of affected communities whereby the government would provide land for housing sites and common infrastructure. This led to immediate tensions on the ground and to stiff public resistance. Fierce opposition and the difficulty of finding land for relocation led the government to modify its rehabilitation policy through a new government order. The new reconstruction policy retained the essence of the previous housing policy in terms of public-private partnership but modified the relocation issue, which remained mandatory only for people residing within 200 m of the high tide line and

optional for those between 200 m and 500 m. Those beyond 500 m would be entitled to housing assistance *in situ*.

The government's post-tsunami response was a very centralized response, where the decision-making, implementation, monitoring and evaluation were managed almost entirely by the government through its bureaucracy with active support from the civil society organizations (CSOs).

The reconstruction was predominantly a contractor-driven approach and community participation typically remained at a minimum. This was determined by the inherent nature of government's concept of partnership, which viewed civil society organizations as little more than contractors. Monetary capacity, rather than experience in post-disaster capacity or contextual knowledge became the only apparent criterion to assess the competence of an external organisation in getting involved in reconstruction¹⁴.

3.4.3 Bihar Kosi Floods

The 2008 Bihar flood, which is one of the worst and disastrous floods in the history of the Indian state of Bihar, occurred due to a breach in the Kosi embankment near Indo-Nepal border (at a place called Kusaha in Nepal) on August 18, 2008. The river changed its course and inundated areas which hadn't experienced floods in many decades now. The flood affected over 2.3 million people in the northern part of Bihar. The flood submerged most of the Kosi alluvial plain area, which is very fertile and has dense agrarian population. The total population of 33,45,545 living in 993 villages of 412 panchayats of 5 districts was affected, in which 3,40,742 houses were damaged and 7,12,140 animals were affected.

The reconstruction in the aftermath of Kosi floods ran into a tussle between the State Government and Centre. Bihar's demand for a Rs 14,808.50 crore-special package was ignored by the Centre, which took the view that Rs 1,010 crore given to the state government as aid would take care of the relief and rescue operations as well as the rehabilitation and reconstruction programmes. The State Government has said that it requires Rs 4,500 crores for

¹⁴ Dwayne Barenstein, Jennifer. 2008. "From Gujarat to Tamil Nadu: Owner-driven vs. Contractor-driven Housing Reconstruction in India."
http://www.sheltercentre.org/sites/default/files/IREC_OwnerDrivenVsContractorDrivenHousingReconstruction.pdf

the construction of approximately three lakh houses alone¹⁵. Almost one year after the "national calamity", Bihar has ended up getting only Rs 117 crores of additional assistance.

While this tussle has been going on for over a year, the people, fed up and unable to wait, went ahead with their own reconstruction. During our field visit in February 2010, many villagers said that there had been no reconstruction announced or started by the government. Many NGOs had in the meanwhile carried on with providing and constructing temporary, interim shelters.

Kosi Rehabilitation and Reconstruction Policy finally announced the Kosi Rehabilitation and Reconstruction Project whose main purpose is to reconstruct the houses, to provide community facilities, complete restoration of infrastructure and livelihood support. It proposed building, retro fitting, repairing and reconstruction of houses for the people through appropriate technology. The government invited the civil society organisations as well as private sector into a PPP approach. The policy of "build better" with a beneficiary-driven approach was to be adopted.

The Policy clearly announced that all the private and public houses shall be reconstructed on the basis of earthquake-resistant design and from the point of view to fight the floods situation in a better manner, in the future. For this, institutional arrangements will be made for promoting the use of calamity-resistant techniques, like necessary technical training, retrofitting, publicity of new construction techniques and the arrangement of material.

3.5. Policy environment & Regulatory mechanisms:

In the last decade, after the wake of the Latur earthquake and the Orissa super-cyclone, and several other disasters, the government and bureaucracy have woken up to the needs of a regulated and systematic reconstruction response. There has been a paradigmatic shift in India's approach to disaster management. The new approach, multi-sectoral, multi-disciplinary, proposing to be holistic and proactive, is now being sought to be built into the development planning process itself¹⁶.

¹⁵ "FM forgets Kosi victims, funds Lankan Tamils"; Giridhar Jha; India Today July 8, 2009

¹⁶ Management Of Disasters And Crisis Situations In India With Focus On The Poor; Katar Singh and Vishwa Ballabh; <http://www.adb.org/Documents/Reports/Consultant/TAR-IND-4066/Agriculture/singh-ballabh.pdf>

3.5.1 Institutional arrangements and reconstruction approaches

Until recently disaster response was a knee-jerk response. There were no specific legislative mechanisms at the Central level that provided a legal framework for disaster response. There have been tremendous moves to systematize disaster response and recovery by the government. All that the government has done and proposes to do in future seems to be impressive on the face of it. However, one is tempted to ask this question: How far has the State been successful in performing the critical function of disaster management, recovery and reconstruction?

The policy decisions of the Government, after all, regulate the kind of reconstruction approach that will be taken, which largely determines the impact of reconstruction on the plurality and sustainability of techniques, materials and design, as well as the satisfaction levels of the affected people.

The Gujarat earthquake reconstruction was tremendously supported by the progressive and people-friendly Owner Driven Reconstruction (ODR) approach and supportive policies and regulatory mechanisms. It saw a variety of approaches in reconstruction methodology that combined people, policy, funding and implementation in different ways to suit the specific context.

In the ODR approach the overall satisfaction with the quality of housing was 93.3%, while in the Community driven / participatory approach the satisfaction was 90.8%. In the in-situ approach satisfaction was 71.6% whereas in the contractor driven relocation approach satisfaction levels were as low as 22.8%.¹⁷

The majority of the people who reconstructed their house under the ODR approach employed construction materials with which they were already familiar, such as bricks, stones and wood. Many people succeeded in rescuing some material from their old houses. Most houses were reconstructed *in situ* following vernacular designs and spatial arrangements, so that the villages reconstructed with Government financial assistance maintained their traditional character. Some people however also introduced innovations, such as flat roofs reflecting the changing tastes and preferences and a selective adoption of new designs, building technologies and construction materials. *Such diversity did not only reflect variations in local values and aesthetics, but also variations in housing requirements.*

¹⁷ Dwayne Barenstein, Jennifer. 2005. "A Comparative Analysis of Six Housing Reconstruction Approaches in Post-Earthquake Gujarat" <http://www.odi.org.uk/hpg/meetings/SUPSI.pdf>

The post-tsunami response was, on the other hand, a very centralized response, where the decision-making, implementation, monitoring, and evaluation were managed almost entirely by the government through its bureaucracy with active support from the civil society organizations (CSOs). These organizations played a role of being negotiators and interface between the people and the policy makers and also eventually became the contractors and implementers euphemistically called 'partners' of the state governments.

As opposed to Gujarat where shelter reconstruction involved agencies with different reconstruction approaches, in Tamil Nadu, the contractor-driven approach was the dominant paradigm and participation of affected people typically remained at a minimum. This was determined by the inherent nature of government's concept of partnership, which viewed civil society organizations as little more than contractors. The reconstruction in Tamil Nadu was mostly unsatisfactory to the people, with the houses being socio-culturally inadequate, of poor quality construction, and the relocation and fragmentation of communities generating severe social conflicts, etc.¹⁸

3.5.2 Guidelines, Building Codes and Norms

Construction and reconstruction involves not only engineering aspects but also a number of planning and architectural aspects, especially with the kind of structures and regional development that are becoming mainstream. Building codes and bye-laws have been a natural evolution as construction practices have grown and evolved over time. The emphasis on rapid industrialisation catalysed the need for standardisation and regulatory mechanisms to assist in the systematic growth of the industry and also to deal with the emerging concerns for environmental protection and energy conservation.

India, apparently, has rigorous building codes. These codes have been incorporated into the by-laws adopted by the municipal corporations. These by-laws require mandatory compliance with the building codes. However, in rural areas, since most of houses are non-engineered, and though there are standards for non-engineered houses, these are not enforced and there is no regulatory authority that does this.

¹⁸ A Comparative Analysis of Six Housing Reconstruction Approaches in Post-Earthquake Gujarat; Jennifer Duyne Barenstein in collaboration with Vijay Joshi, Swati Shriniwas Shinde, Shailesh Vyas, Yogesh Jadeja; <http://www.odi.org.uk/hpg/meetings/SUPSI.pdf>

After the Gujarat earthquake, the Ahmedabad Municipal Corporation (AMC) deployed several teams of structural engineers, architects and senior civil engineers for a technical survey of all the damaged buildings. Each team came up with at least four to five buildings on an average, which would have to undergo major repairs before the occupants could move back in. These teams found many violations of the Indian Standard Code and the violations were most prevalent in low-rise structures. The quality of concrete used in columns and building frames deviated from norms stipulated in the building codes. At Bhuj, all of more than 100 multi-storey buildings that were built over the last five years either collapsed, or have been certified as unsafe for habitation. The builders cut cost, used more concrete and less steel. Staircases were not integrated into buildings, etc. which caused their collapse. Although the AMC appointed the Centre for Environmental Planning and Technology (CEPT) as a nodal agency for providing technical services, it was unable to find enough structural engineers. A great number of structural engineers were required to deal with the reconstruction and retrofitting all over the state.



Figure3. 1: A leaning building.
Recipe for disaster.

This situation brought one fact to the fore. RCC (Reinforced cement concrete) structures are most mooted for their 'safety' and durability. If, however, technical requirements are not strictly followed, these aspects of the RCC structure becomes meaningless and they only end up becoming a hazard – which instead of just injuring can very well become the reason for loss of lives. Since RCC is not traditional material, people are not familiar with its nature and its requirements and often fall short in their ability to maintain and repair these structures. These then degrade or collapse within a few years, defeating the very purpose for which they were built i.e. to provide a 'pucca' and a 'safe' house.

Contradictions in guidelines and building norms and practices

In normal times, more than 70% of the people build their own homes - all different, using a variety of locally available materials, completely custom-built and contextualized, energy efficient and user-friendly. The government, the private sector and any other actor builds either the remaining 30% and is of course involved in regional infrastructure development.



Fig 3.2 A degraded RCC ceiling. People neither have money nor the knowledge to maintain and repair these structures. Chatar Ghat, Khagaria District, Bihar



Fig 3.3 An Indira Awas Yojana structure which is degraded and falling apart being used as an Anganwadi.. Ilmas Village, Samasthipur District, Bihar

RCC structures need a lot of care in construction and maintenance especially in a highly corrosive coastal environment. If the quality of construction cannot be ensured, over a period of time, it can jeopardize safety as well as tremendously escalate maintenance costs.

Poor quality of construction is not due to the fault of building materials, but the way in which they are used. The quality of construction and the attention to detail assume great importance in India, where standards and specifications are not strictly followed in the residential building construction scene. It is therefore essential to understand some fundamental issues with regard to various aspects of construction.

- Benny Kuriakose, Architect

Hence, People's Architecture is a dominant feature in the country and traditional, people's methods and techniques would and should be the dominant mainstream technique. And being the dominant mainstream method should be influencing the kind of research that takes place or the kind of policies that get constructed. However, this is not the case. Neither the government's policies nor the R&D laboratories of any institution "recognize" these dominant methods, dismissing them as frail, temporary and unsafe structures. They reject the dominant, natural materials being used: mud, stone, grass, bamboo, wood and a host of other local materials, in favour of the modern and new materials of concrete and steel.

These two strong forces – the government and the expert – are much involved in creating and promoting “new” materials and technologies that are expensive, not easily or locally available, difficult to create or maintain by ordinary people in their day to day lives and above all, are destructive to the natural environment. The policies and regulations support these new materials and technologies and the market is driven by them and which in turn drives the R&D further in the same direction. Slowly, over the decades, these non-dominant materials, techniques and technologies have become “mainstream”, in the process sidelining and eliminating the local and traditional materials.

In sharp contrast to usual construction by people, in reconstruction, more than 80-85% of the homes get routinely constructed by the civil society organizations, contractors and the government, for the people. Almost all of them are built with the “new” technologies, with some of the alternatives also occasionally coming into use. The traditional, local materials almost always do not get used. Uniformity is maintained with the design, material and technology almost always “decided” by the dominant forces of government and scientist.

Yet, in contrast to this all-prevalent ‘practice’, all the reconstruction guidelines advocate involving people in the decision making - in design, in monitoring, and in execution. The guidelines refer to “sustainable” and “safe” approaches, advise use of local materials and local skills that will help the livelihood regeneration in the region.

These kinds of contradictions between mainstream practice and trends and codes and guidelines are difficult to understand and analyse.

3.5.3 Where ‘guidelines’ fail and/or are inadequate

Guidelines in times of reconstruction become particularly important, for they are instrumental in determining what ultimately becomes a norm at that particular time and that sets examples of what ‘development’ is about in further times to come. Hence, it becomes important to ensure that these guidelines are inclusive of traditional practices and promote plurality and sustainability. This would not only enable people to retain their self-sufficiency and self-reliance but also will not distort the understanding of ‘development’.

Even if the initial policies of the government do not include some of the more progressive aspects, it has to remain open to critique and be flexible enough to incorporate observations and recommendations of citizens. If it does not do so, assessments and evaluation by citizens

become mere lip-service and eventually erode any trust that can be built between the citizen and the Expert/Establishment.

We clearly see instances of failures in Tamil Nadu. The first socio-technical assessment of post tsunami reconstruction¹⁹ in Tamil Nadu, pointed out that there were many constraints in reconstruction due to use of concrete based technologies involving high professional skills instead of artisanal knowledge, extremely high costs and relocation of settlements. High demand levels had put pressure on extraction of materials and often led to scarcity of good quality materials and skills. The assessment reports particularly recommended inclusion of more materials and technologies that were in use in the region traditionally so that people have wider options to build safer habitats with their own resources and skills. However, these recommendations of the assessments were not incorporated and the reconstruction continued along earlier lines. In the final assessment, the evaluators pointed out these lapses of the government to incorporate the observations and recommendations of the evaluation teams.

This was not the case only in the construction of permanent shelters, but also in putting up of temporary and interim shelters. The civil society organisations with help of many technically qualified experts had presented to the government recommendations for guidelines on temporary and permanent shelters along with the processes that are best put in place. Initially, these recommendations were well taken; however, at the implementation stage, suddenly all these recommendations were put aside and temporary shelters were built using materials that had to be largely brought from outside. These were made out of bitumen sheets, which were supposed to be fire-resistant, in favour of the local coconut-leaves thatch and mats (which was also expected to become a livelihood generation option for the people) which had been recommended by the CSOs.

The mid-term assessment of shelter reconstruction by UNDP, Hunnarshala and NCRC clearly indicated that though lay out plans for each site had been prepared and formal approval procedure followed, planning norms about open spaces, community infrastructure, land use, etc. were not incorporated except in few instances. It recommended that layout planning norms must be provided as guidelines and implemented; further, it recommended that site analysis and planning guidelines should also be brought out so that the same can be followed. None of these

¹⁹ www.un.org.in/untrs/reports

recommendations were incorporated even in the second phase of reconstruction carried out by the government.

In contrast, we see in Bihar's floods reconstruction, recommendations and norms from experts, pushing for a RCC-column-beam structure in the name of "safety". However, the issues of safety and durability become meaningless without adequate measures to ensure that the required building codes and standards are met, getting further intensified in face of corruption and non-compliance of requirements. These kinds of recommendations further contribute to elimination of plurality, people's systems and sustainable approaches. The analysis produced below, by one of most respected advisors to the government, is an example of such a solution being posited for Bihar in particular and for India in general:

Mud and unburnt brick walls when inundated under water become soft losing their dry strength by even as much as 85% of the dry value and therefore, start collapsing when inundated for longer duration of time.

Burnt brick and stone houses are usually constructed using mud mortar in the rural areas. The mud mortar also becomes soft under continuous wetting under water by which the walls lose their bearing strength and tend to collapse under their own weight or the weight of the roof. Also, if the water is flowing, they collapse more easily under the dynamic pressure of water. The houses made from light weight materials like GI or other Metal sheets or grass, leaves, reeds, bamboo etc. easily float away as soon as their holding down posts are uprooted by the flowing water.

One has to choose from such materials and technology options which will save the house from all types of natural hazards, for example one can use deep piles for the foundations with an appropriate plinth beam above the high flood level, use reinforced concrete or reinforced brickwork super-structure with flat RCC slab-beam roof approachable by an appropriate staircase. This will result into a very safe house.

Considering the multi-hazard situation in the districts in North Bihar, it is strongly recommended that all houses under the proposed scheme of the Bihar Govt. should not only be of permanent nature capable of resisting the flood hazard but also should be made safe, in the first instance, against the earthquake hazard postulated in the seismic zoning map, of India. The houses should have a flat roof as recommended by NDMA, Flood Safety Guidelines, which could be used by the residents as temporary shelters. The designs proposed here satisfy all the safety requirements and have been so planned that it is feasible to construct such houses at very economical costs.

Professor Anand S. Arya And Ankush Agarwal, Under The GoI-UNDP Disaster Risk Management Programme

3.6. “Whose space is it anyway?”

3.6.1 The ‘Client’ and the Commission

The *Client* has a huge impact on *what* finally gets built, *when* it gets built and *how* it gets built. Who builds becomes the next important factor. A combination of people-as-client and people-as-builders has completely different results from people-as-client and contractors-as-builders or people-as-client and NGOs-as-builders or government-as-client and NGOs-as-builders or government-as-client and contractors-as-builders. Who decides what gets built and who executes the decision impacts the conditions and constraints of reconstruction.

In Gujarat the different approaches and options given to the people created options to be completely independent and build for themselves, or could engage with an organization who would help and facilitate the building process by providing expertise and guidance, or alternatively they could hand-over the building process completely to someone else – either an NGO or even a contractor. People made different choices and there were different impacts and satisfaction levels.

The majority of the people who reconstructed their house under the ODR approach employed construction materials with which they were already familiar, such as bricks, stones and wood. Many people succeeded in rescuing some material from their old houses. Most houses were reconstructed *in situ* following vernacular designs and spatial arrangements, so that the villages reconstructed with Government financial assistance maintained their traditional character. Some people however also introduced innovations, such as flat roofs reflecting the changing tastes and preferences and a selective adoption of new designs, building technologies and construction materials. Such diversity did not only reflect variations in local values and aesthetics, but also variations in housing requirements²⁰.

The entire resettlement and reconstruction process was controlled by the Tamil Nadu government in a way that rendered NGOs into mere contractors and the community into ‘beneficiaries’. The contract was between the government and the NGO and the construction process was monitored by the local bureaucracy. The designs had to be submitted to the local technical bureaucrats for approval before construction itself and could not be changed or modified thereafter.

²⁰ A Comparative Analysis of Six Housing Reconstruction Approaches in Post-Earthquake Gujarat; Jennifer Duyne Barenstein in collaboration with Vijay Joshi, Swati Shrinivas Shinde, Shailesh Vyas, Yogesh Jadeja; <http://www.odi.org.uk/hpg/meetings/SUPSI.pdf>

The government, thus, became the 'super client' with all interventions responding to the priorities expressed by this entity. Added to this was the fact that in most cases, the beneficiaries did not know which house was theirs, so even if so desired by an implementing NGO, the design could not respond or be adapted to the lifestyle, occupational needs, community relationships, size of family, special needs etc. of the beneficiary. The architect/ designer/ planner too, helpless in the face of a political and bureaucratic 'whip', was forced to adhere to prescribed building codes, to RCC-column-beam-structures and had very little scope to negotiate a better design response.

The uniformity, while trying to eliminate inequity, also eliminated creativity and sensitivity. Many organizations brought in whole execution teams from outside and went about reconstruction entirely on their own with little interaction with the communities. Some of them achieved great speed and efficiency and 'completed' their 'jobs' in the stipulated time. However the 'lack of ownership' felt by the community was evident, as in many instances these houses were left unoccupied due to a variety of reasons. During our visit to some of the villages in Villupuram District in 2006, we observed that the houses in Mudaliyarkuppam, Villupuram District, were unoccupied. 99 houses had been built by an organisation. However the community continued to live close-by in their hutments as their contention was that there were around 120 households in the village and they needed those many houses. Otherwise this would divide the village. One of the community persons said, "How can we live in big houses, when some of our own family members are living next to us in huts? Will it not create problems between us?". Justice and equity become one of the major issues in such instances.

Many NGOs did their best to get the community to participate – they held consultations with the community, tried to understand the community's needs and requirements and tried to inform the community of the choices available under these circumstances. However, in many cases it was a rocky path as the community people did not know which were their houses or even relocation sites and could not identify with the process. Over a period of time, they became blasé and tired, and participation often became more a consensus building process.

In some cases, NGOs went "outside" the process and worked directly with the communities and they became the clients. The land was bought either by the community or purchased by the donor/NGO on their behalf and the villages were resettled on them. The reconstruction process here was entirely different as the designs, processes and priorities were entirely set by the

communities. They also directly engaged in the construction, monitored the construction process and negotiated for any changes.

Rajakamangalamthurai – within the CRZ (Coastal Regulation Zone)

Architecture & Development's intervention in Rajakamangalamthurai, Kanyakumari District, was a case where the NGO decided to go out of the government's process and work directly with the people. A&D was much against the "200 metres away from the sea" requirement. They and the people believed that the people should stay where they always have and where they wanted, in a way that did not hinder their livelihood. As part of this project, the donor agreed to support the purchase of land for the people. 2 acres was purchased in the village, and homes were built for the beneficiaries. Because the project was "outside" the government's process, no help could be garnered from the government. Water, electricity, sewage and services – in fact all the parts which the local panchayat would pay for had to be paid for by the project. Special permissions had to be taken for bringing in the basic services to the project.

Veerapakupathy – when people decide

After the tsunami destroyed the lives and assets of the people of Veerapakupathy, Kanyakumari, they decided to relocate the village farther away from the sea. They bought some land close to the old village but 500 meters from the sea in February 2005. They chose not to be part of the Government's reconstruction process. They looked for their own funding and own implementers.

The land was initially divided into seven different plots, owned by different owners. The community managed to assemble it as one allotment. They bought the land at the price of 4,000, 5,000, 5,500, and 7,000 INR per cent. In total they acquired 327.5 cents of land, or 142,645 square feet.

The community organized itself so that the people, most affected by the tsunami and with the lowest income would have to pay less for the same space than a less affected person. The families that had lost their house completely paid 18,000 INR for their plots, the families which had their houses only partly damaged paid 20,000 INR, and the ones which had not suffered any damage to their house paid 25,000 INR.

The land was then divided into 82 plots and to avoid any mis-understandings, these plots were allotted through lottery. In total, 82 families bought 3 cents of land each and participated in the acquisition of 51 cents of communal roads and 31 cents of community land. 76 families came from Veerapakupathy and 6 other families came from neighboring communities or with family ties with people in Veerapakupathy. The power of attorney was given to Ezhaya Perumal, a

senior village member who kept the community land in his name until it was possible to hand it over to the local administration. The new village came to be known officially as Veerapakupathy Nagar Therivilai.

One of the key elements of this village has been the community's involvement in all aspects. In fact, almost all decisions were taken entirely by the community – purchase and allocation of land, village layout, design of the houses, choice of organization they wanted to work with, facilities required within the village, etc.

What was very clear in this particular instance was when people decide, the questions of equitable distribution are taken care of, especially in a cohesive community. The community ensures that the least able gets adequately compensated while the most able supports the process.

There were many examples that came up during field visits that illustrate that community decisions could be inclusive and just. The fishing community in Tamil Nadu proved this time and again, right from the relief processes to the reconstruction process. The community decisions were taken by the 'community elders'. The decision making systems are complex among the fishing community. Each village has its own group of 'elders' and each cluster of villages then has an 'elders' group'. Hence decision making among the fishing community gets decided by the groups of elders and is very strictly adhered to by the rest of the community.

During the relief distribution process, in many instances, the community refused to accept the provisions and materials, if it was not distributed to the whole village. The decision extended to reconstruction too. In many reconstructed villages, people did not occupy houses because the all the families in the village did not get houses. The decisions to provide housing to only the 'affected' families had created divisions among the community – between the affected populations and the rest of the village. Veerapakupathy too had similar problems. Only 18 families were technically 'affected' and were expected to get compensation and 'new' houses. However, the whole village decided that it was not possible to discriminate in such a way. Thus, they decided to use the money received in compensation and buy their own land and build for themselves.

3.6.2 Site allocation: Relocation vs. In-situ Reconstruction

Relocation versus In-situ Reconstruction has always been a contentious issue, which makes it difficult to build a consensus within the community and create harmonious negotiations between various stakeholders. The decision is a difficult one and is best arrived at in full participation with the community at local and even regional levels. Decision on in-situ reconstruction or relocation also goes a long way in determining what kind of structures will get built. A relocation approach pre-supposes a standardized reconstruction of large-scale houses on given sites in a short period, almost always ending in iron-grid layouts and concrete box houses. In-situ reconstruction, however, due to a variety of site sizes and types, forces non-uniform, non-standardized response.

The reconstruction of Bhuj in Gujarat is one of the best examples of how relocation could be handled in an inclusive manner. With the entire city destroyed and under rubble, relocation seemed inevitable. There were many issues in relocation as well as in in-situ reconstruction. These were however most creatively solved, with the strongest involvement and decision-making by the community. It stands as one of finest examples that show that when the community is directly involved, the best choices and decisions are made.

Small towns in India have very narrow lanes. They have the cul-de-sac systems. The Environment Planning Collaborative (Ahmedabad) worked in Bhuj after the earthquake. It was impossible to get into the city. The inner city was completely destroyed and because of the narrowness of lanes it was difficult to have rescue systems in place. There were about 588 plots needed whereas there was place only for 390 plots. So if a well laid out inner town was to be developed again, 30% people would have to move out.

We held several public meetings and put the problem before the people. They themselves made a decision. Based on this, everybody was asked to apply stating clearly whether they wanted to move out to a new laid out larger plot or continue staying within the old city with deduction on their original plot size. About 38% opted to move out. The people who had commercial interests within the city, they did not mind having some deductions. So the entire inner city was actually taken away from the owners for a period of three months and re-planning was done. There were a lot of problems at the individual level, which the various committees set-up had to solve on one on one basis.

- Sandeep Virmani, Architect, Hunnarshala, in a talk at *at the Conference in Paris, 2006; "Sustainable Built Environment: an Indian Experience - Approaches and Practices Overview"*.

In Tamil Nadu, the government unilaterally decided that the communities had to be relocated 500 metres away from their shore-side villages as a "safety" norm. The 'resettlement' was riddled with conflict, negotiations and confusion. The conflict has been between the people and the government. Seemingly for the 'good' of the people and their safety, the relocation raised many questions. Why relocate a community that is dependent on the visibility of the sea so far?

What happens to the 'remaining' families? Will the communities and some families be torn apart just to fulfill the safety perception of the government? Is there a more nefarious political agenda behind this move? Is the government planning to sell off the coastline to developers? Many such questions were bandied. NGOs, local communities and the government went through a long process of negotiations, which delayed the reconstruction process by almost 6-8 months.

The community managed to negotiate with the government and brought down the minimum distance from the sea to 200 meters instead of 500 meters. They also negotiated such that they could keep control over their old space while relocating to a new site.

The decision to relocate was a bad one for the government in the long-term. Land prices shot up and the government had to pay 3-5 times the price during normal times. In many places like in Kanyakumari, where the density of population is very high and the coastal bands narrow, land was not available at all. Land acquisition became a long process and reconstruction was further delayed and people waited in temporary shelters, and the NGOs and donors waited with funding and implementation teams.

In many cases the lands acquired were very inappropriate to build on – low lying, prone to water-logging areas, areas where the salt water ingress is high, lands on edges of salt-pans, soil too soft to build on, sites too small to accommodate the expected population, lands too far-off from the old community and so on... the list is endless. The sites acquired were so bad in several instances that some of the organizations decided to 'opt out' – they refused to be part of reconstruction on bad sites. Auroville was one such organization and chose not to build at all and played a technical-support role to the implementers. Architecture & Development, on the other hand, in partnership with donors and people acquired land on their own or built in-situ. In another case, the organization built a village where the land was bought by the people themselves and played the role of 'technical consultant' to the community.

3.6.3 Habitat Planning / Settlement Design

Habitats do not happen. Habitats develop - over time, over years, over decades. They are developed by the people who inhabit these habitats – they add, modify, take away, build, renovate, restore as per the needs that are felt in a given context, in a given time, much related with the geographical conditions and context. It is hence not necessary that a response that was

appropriate in a given time, in a given context, with a given community will be appropriate in another time and another context, with another community. Habitat planning, settlement design and site sensitivity often get sidelined in reconstruction. Water channels are blocked, water bodies are filled, trees are felled and undulating land is leveled. This happens in normal times too, but is more clearly visible in reconstruction.

The Gujarat and Tamil Nadu experiences were diametrically opposite. The one in Gujarat was evolved through a discussion with people, while the other was imposed by an external decision. Almost all the settlement designs were made by 'experts' in the field in Tamil Nadu, most often driven by the criteria of efficiency – defined by speed and time. The reconstruction design response here very visibly came from an urban and a 'western', mind, which perceived a compartmentalized lifestyle to be an ideal. Where rural, communal interactions happened seamlessly in a variety of ways – at the well, at the borewell, under the tree, at the tea centre, at the bus stop, at the market, these were now expected to happen in specified, marked-out areas – parks, 'open spaces', community centres, and sometimes nowhere. Where the rural home flowed into the street in a single fabric of private and public life, they were now on demarcated 'plots', that encourage territorial fencing, insulating the family in a way which is new to the community.

Except for a few exceptions, the site planning response has been a disaster in itself. Where earlier the acquired sites were undulating, covered by shrubs and trees and dotted with small water bodies, they now are 'prepared' and 'treated' - cleared, leveled, or filled. The sites lost their character, their ambience and their soul. The environmental costs of such hasty action will be borne by the communities for generations to come. The sites are bare, featureless and the few remaining water bodies only threaten to become potential waste pits. The earlier clustered, meandering layouts of the villages have given way to albeit efficient but unfamiliar and rigid grid formats. Where one fostered interaction and connection, the other has transformed communities to nuclear families.

The post-tsunami reconstruction was completely insensitive to culture and lifestyle as one came upon rows and rows of 'concrete boxes' laid out in army-barracks style grid pattern, with uniform design, uniform materials, uniform colours. It eliminated plurality of design and layout. One is not talking about a few hundred houses here but thousands of houses. It was a disaster in the making.

Reconstruction sites ... uniform villages everywhere



Fig 3.4 Layout of an old village. Drawn by the people in a PRA



Fig 3.5 A grid-iron layout of a newly reconstructed village

"I think it's a waste of money to level a well moulded site..... If only we didn't level sites, and eliminate trees but instead plan to go around them; then we wouldn't get the long monotonous rows of houses to begin with" - Laurie Baker

Fig 3.6 Look-alike reconstruction sites

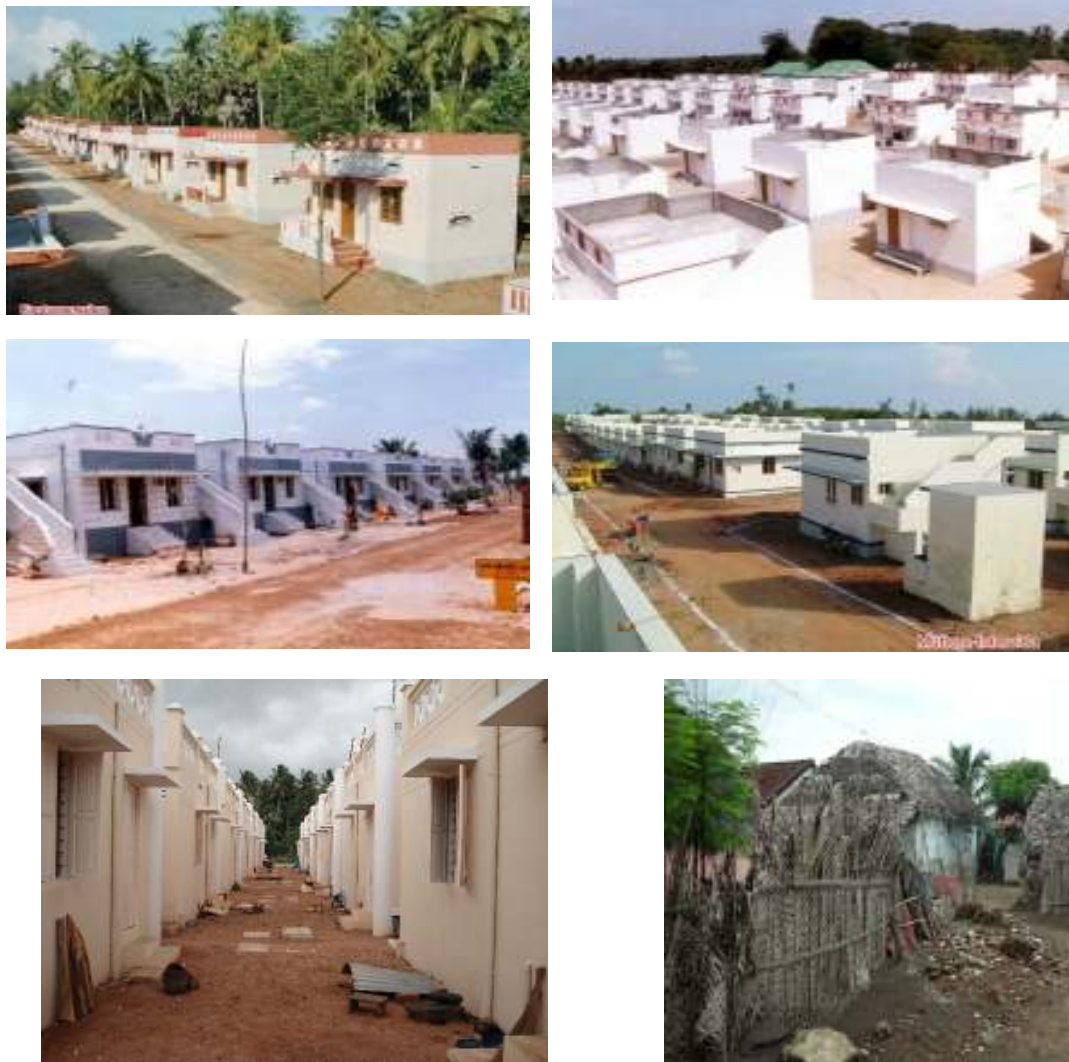


Fig 3.7 The backyards of the new houses

Issues about Habitat Planning, Settlement Design, and regional development, almost always decided by the government with little or no involvement of the people, can best be highlighted by the discussion of the 2 major instances in the tsunami affected Tamil Nadu and in the Kosi floods affected Bihar.

The Sellur fiasco

David Korten brings out the dilemma interestingly, referring to writings when Rem Koolhaas's firm's had initiated work in China. Koolhaas had written: "It seems clear that somehow we

should be able, when given the impossibly difficult problem of designing in two weeks a city for three million people, to respond with vigor and skill.”

If you come across a client, I mean one who wants everything that you don't believe in, then you can say that, really, you've come to the wrong person and I don't want to do it.

- Laurie Baker

To this, David Korten says: But was it not conceivable that the design for a city for three million should take longer than 2 weeks? That some background research, and at the very least environmental studies would have needed to be done? That some reflection might have been necessary on which populations were to be displaced to accommodate and populate such a city? That perhaps such a commission presented serious ethical issues for the architect and might have called for his or her principled resistance and that *that* was where vigor and skill were called for?

These are precisely the dilemmas and questions that confronted the Habitat professionals who were expected to create a “master plan” for Sellur in 2 weeks. Though the planning and design was not for 3 million people, it was still complex, as it involved bringing together different communities, from different villages. It meant uprooting existing community inter-relationships and planting these into new relationships and the host of socio-cultural-political issues that made felt during such implantations.

Sellur in Tamil Nadu is the rehabilitation site of 53 acres for 1,000 families. The site was allocated to 6 NGOs to build new houses for ‘beneficiaries’ who were from 5-6 different villages, from different communities and having different occupations. The site was an undulating land, with little water bodies and trees dotting the landscape. There was a main road, the highway that cut across the Site and high tension wires that ran diagonally across the land.

The problem of creating a layout was complex as it involved a variety of stakeholders from different walks of life. There were the socio-cultural, environmental and political aspects to be addressed. A&D and the ODTF combine were approached for doing a study and layout mapping. It was clear that this would require a lot of time – time to understand the people and communities, their requirements, their inter-relationships. It would require time to organize the layout such that minimum damage is done to the natural features. It would require time to bring

the different NGOs together and arrive at a consensual modality of working. However the combine was given two weeks to complete the plan and to complete a task that would at least take 3 months. It was clear that if one took up the assignment, it would be detrimental to the process of reconstruction and detrimental to the people in the long run. Seeing the impossibility of it, the task had to be reluctantly turned down, even though the challenge was a very interesting one professionally.

The Sellur rehabilitation site is a sight to see now. All trees were cleared. Land was filled and flattened. And a uniform, grid-pattern layout was put in place. People were shifted even before the basic services were put in place. The water bodies became places for defecation and were contaminated. The site was prone to flooding during the monsoon.

What is the responsibility of the government, the professional and the people in such a situation? What kind of violence gets perpetrated, unwittingly perhaps, by unconsidered decisions of ‘experts’?

The Kosi Embankments – an elephant in the room

It is impossible to talk about floods in Bihar without talking about the embankments being built around its rivers. The embankments are “an elephant in the room” that everybody knows about, understands and can see, but refuses to acknowledge - either its presence or its impact.

When we went to Bihar, and we talked to people about the August 2008 floods, it became more and more clear that these particular floods which were highlighted so much in the press are the least of their problems. We found out, by talking to the people, that the Kosi has breached its embankments several times, eight times to be exact, earlier, and the people living along this river have repeatedly been subjected to the impacts of river in spate rushing out. It became clear that life in Bihar could very clearly be demarcated – life before the embankments and life after the embankments.

The rivers in Bihar come rushing down the Himalayas, bringing with them silt laden waters that flood and spread during summer and monsoon. The floods would spread over a large area, leaving behind filled up tanks and ponds, a layer of live-giving silt that rejuvenated the agricultural lands. The people would have to “manage” living during the flood-season which was

about 2-3 weeks in a year. The people had learnt to live with the floods, understanding the rhythm of the rivers.

However, during the “modern development” and growth period, the government decided to “fix” this problem by building embankments on both sides of the Kosi, thus forcing her to flow inside it. The solution worked – but only for a little while. Before long, the embankments became one of the biggest problems of the people living along the river. The silt brought down by the river, kept filling up and thus raising the height of river. Today we can see the river flowing 8-10 ft above the normal ground-level – a sure recipe for disaster.

Every engineer, scientist, technologist knows one fact about embankments – that they will breach. It is a given fact, corroborated with experiences from all over the world. The problem then is what happens when the

“Kosi used to come like a cat before, now she comes like a tigress”.

- Aslam Mohammed, Village Raxia,

embankments breach? And that has become the problem now. The river’s force has become destructive and the floods that come now damage thousands of houses and structures, fill the lands with sand and silt and costs the government and the people millions and millions of rupees. The river beds rises at the rate of a 1-2 feet per year, rendering any embankment useless after 20 years.

For us, life is uncertain at the best and death and loss of livelihood certain at the worst. For the other many villages along the embankments, people live in constant fear and threat of an embankment breach.

- People of Raxia, Seetamarhi District, Bihar

The problem does not end there. The embankments have brought with them long-term problems. The whole drainage in the region has been upset and the waters have nowhere to go. This has created a problem of water-logging for millions of hectares of land. People have lost their lands to water-logging. Where earlier these regions were agricultural regions, now they have over the decades become “wetlands” and one observes a change in the whole ecosystem. Habitats have changed. **Reconstruction under such circumstances has become a way of life.** And any debate on reconstruction and ethics in Bihar has to consider the elephant in the room.

Does anyone listen to the dissenting voice or even suggestions ‘not favourable’ to the establishment even during peace time? Do laymen have to tell the establishment manned by thousands of engineers that it was their job to keep the river in place and the embankments were meant precisely for that purpose?

What line does a discussion on ethics in Built Environment and more important on Science & Technology have to take, under such circumstances, where a “technological solution” has created a perpetual disaster for the people – and especially those who are the most vulnerable, poor and the marginalized. This has been a technology solution that has been violent, unjust, unsustainable and that has totally eliminated a peoples’ way of life.

All discussions on disaster reconstruction, recovery and rehabilitation skirt around the issue. The guidelines and the policies do not acknowledge the root cause of an unsolvable problem, but continue to posit further, similar ‘technological’ solutions. *How does one reconcile the contradiction in the situation where a solution by the government + expert/scientist combine have imposed a perpetual disaster on the people on one hand and on the other, that they now come with ‘support’ and ‘assistance’ and talk about people’s participation, ‘earthquake safety norms’, disaster-proofing and sustainability?*

3.6.4 Building: design, materials and technologies

Design

Jordi Sanchez-Cuenca, an architect for Architecture & Development who volunteered during the reconstruction of three villages in Kanyakumari district, articulated the problem of habitat design and its solution thus: *Improving the habitat, means improving the social and physical structures in an intertwined manner*²¹. The only way a good design can happen is when the people living in these conditions who have a problem are at the centre of any intervention. No professional, no expert can ever understand the true nature and cause of the people’s problems like the way they do. Hence, good design cannot happen unless it is the people themselves who define them.

²¹ Human habitats have 2 components – social structures and physical structures. The social structures are the institutions, organisations and activities that keep the society together and allow for improvements in all aspects of life: Family, enterprises and other forms of livelihood, laws, norms, traditions and habits, Government and NGOs, CBOs, religion, etc. The physical structures are the buildings and infrastructure that accommodate people and their social structures: Houses, community centres, markets, workshops, industrial buildings and machinery, government buildings, etc.; Roads, water pipes, wells, sewage pipes, treatment plants, electricity poles and lines, benches, bins, sheds, etc. Inadequate habitats have always roots in social structures: insufficient income, no access to good education/ health, social discrimination/ marginalisation, powerlessness (no influence in actions/ decisions that affect their habitat) etc.

The mid-term assessment of the post-tsunami reconstruction conducted by UNDP clearly indicated that the lack of community participation was visible. Almost nobody from the community was involved in decision making and management of construction. The idea of replicating one standard design alone shows that the house doesn't reflect any particular family's functional needs and such customization is not planned or encouraged. Very little labour or employment is being availed by local people. Materials and technology of RCC being used do not have potential for replicability as they are not affordable and require high engineering skill that are not locally available²².

From the results of studies on the performance of buildings during past disasters the following recommendations emerge:

- Certain building types, such as, earthen houses, random rubble masonry as well as brickwork in clay mud/mortar, should be ruled out in severe disaster prone zones, coastal zones vulnerable for cyclone and Tsunami.
- Rich mortars involving cement and lime should be used in fired brick and/or coursed stone masonry.
- Required steel reinforcement should be introduced in the walls in both directions of the building.
- Light roofs should be properly anchored.
-

"Guidelines For Reconstruction Of Houses Affected By Tsunami In Tamilnadu": Revenue Administration, Disaster Management & Mitigation Department, Government of Tamil Nadu

The guidelines in Tamil Nadu determined what materials could be used and what could not be used and thus eliminated all traditional and local materials that were the characteristic of the region and brought in the RCC-beam-column structure in a big way. Secondly, a project approach that makes Time + Cost + Quality as the only key factors, invariably means an assembly line approach wherein there is no space for articulation and implementation of customized design.

Materials & Methods: traditional/local, alternative, modern

Though there was no policy environment to ensure such an approach, many NGOs used alternative materials and technologies in shelter reconstruction. Organisations like Architecture & Development, Development Alternatives, Centre for Environment Education, Tata Relief Committee, Habitat Technology Group, Auroville, SIFFS etc. used fly-ash bricks and blocks, rat-trap bond walling and filler-slab roofing, etc. and put in place modern technologies like solar

²² Mid Term Socio-Technical Assessment of Post Tsunami Reconstruction, Tamilnadu; Commissioned by UNDP, NCRC and conducted by Hunnarshala

energy, desalinisation for water, extensive rain water harvesting, sustainable sanitation & sewage systems etc. Many of these also have been for “demonstration” reasons, hoping for an eventual acceptance of alternative materials and technologies by the government and thus legitimization of these in the mainstream construction, which was hitherto not available.



Fig 3.8 Filler-slab roof, rat-trap bond walling, permeable roads and drains (water management), ‘pucca’ brick and tile bhungas, rain-water harvesting, solar street lights.

3.6.5. “Fusion” approaches

Though there are pros and cons that exist of traditional or local building materials, local communities have synthesized a fusion of the modern materials and technologies and traditional practices in such a manner that the benefits of both are retained whilst eliminating the fall-outs in them. Examples of such “fusion” can be seen especially after a reconstruction is over when the ‘core-house’ then gets extended with traditional materials – either with a thatch roof semi-permanent structure on the roof or the extensions to verandahs and rooms. Similarly the

modern kitchens get adapted too. Kitchens are once again brought out, as the local people like and the core-house kitchen gets used as a storage-cum-additional living/ working space.

In other cases where people are left to build themselves, there have been a variety of combination of walling and roofing materials with a standard, modern 'foundation' and beams. People use a variety of grass, bamboo mats, wattle-daub, earth, brick, etc. fillings for walls and thatch roof, tiles, GI-sheets, plastic sheets, etc. for the roof.

The reasons for this response are varied. It is economic – the amount of money one has goes a long way in deciding what kind of materials one will use. Second determinant is the skill available. Most people from local communities either have a basic knowledge of how to build or the skill is available within the village. The cost of artisanal labour in local systems is much less than, say, a mason's cost. Third is the durability factor. If money and skill are available, the choice of material is based on its longevity and maintenance requirements. Hence often GI sheets are more favoured over a thatch roof. Or brick with mud mortar is preferred over wattle-daub.



Fig 3.9 A 'fusion' house built by an affected family themselves. Gi-sheet roof, bamboo jaali and bamboo slats walls, cement 'columns', bamboo pillars, bamboo roof structure



Fig 3.10 An Indira Awas Yojana house of brick and cement, tile with bamboo roof, cement columns and mud-thatch-bamboo sleeping quarters as additional room.



Fig 3.11 A fusion house: tile-roof verandah; GI-sheet roof for main house, mud walls, bamboo roof structure. A lot of the materials are recycled materials retrieved from the old damaged house.

3.7. People's Initiatives: Plurality, Sustainability and Justice

People's initiatives in built environment have been going on for millennia. From the time the first shelter was built by a human being who wanted to protect himself from the vagaries of nature, till today when people all over the world are continuing to build, it is the initiatives from the communities and the common man that has given impetus to progress.

People have always used what is around them to build. They have used the mud, the stone, the grass, the wood and all naturally available materials that could be picked and chosen from around the area where they lived and used these materials to the best of their ability. This continues to happen even today, not only in rural areas, but also in urban slums. In the rural areas, where local natural materials are available, they are used in a variety of ways – mud, thatch, grass, bamboo, wood, etc. get efficiently used in different permutations and combinations to precisely serve the needs of the family and community. In the urban slums, too, locally available materials are used creatively and ingenuously by people – whether plastic sheets, discarded plywood and tin sheets, or even waste from hardboard and cardboards – all these are put together in the best possible manner to create the shelter that people need.

Laurie Baker, known as the “Gandhian Builder”, very beautifully brings out the nature and strength of People's Knowledge in construction in his discourse²³. He says:

Before we came along with our high technologies and our science, people over thousands of years were doing what we are now pleased to call research and development. Anywhere you go in India, any village, any rural area there is this, `rural' design that is steadily going on, and this research is not something that was thought out suddenly. It was a system of trial and error — an empirical form of development...

... I suppose it took many years before I really understood and wholeheartedly believed that wherever I went I saw, in the local indigenous style of architecture, the results of thousands of years of research on how to use only immediately-available, local materials to make structurally stable buildings that could cope with the local climatic conditions, with the local geography and topography, with all the hazards of nature (whether mineral, vegetable, insect, bird or animal), with the possible hostility of neighbours, and that could accommodate all the requirements of local religious, social and cultural patterns of living. This was an astounding, wonderful and incredible achievement which no modern, twentieth century architect, or people I know of, has ever made.

²³ www.lauriebaker.net

When I made my own little personal discoveries, I realized that I had merely chanced to find an extensive set of building systems which were in no way 'discoveries' to more than five hundred million people!

The nature of people's knowledge in construction follows the principles of 'do no harm to another' and 'do not harm nature' and thus are just, equitable and sustainable. They are diverse and plural and context specific. They are very much within the reach of people – physically and economically. And above all and most importantly, these systems foster self-sufficiency within the people, putting all decision making in people's hands. This is seen in the materials used, design logic followed and techniques and technologies used.

The materials are environment friendly – they use very little energy to extract or produce, they are available locally hence do not require transportation, most of them are 'renewable', are efficient in the use of resources and are practical in their application.



Figure 3.12: Bamboo mat and mud



Figure 2: Bamboo slats



Figure 3.14: Woven coconut leaves



Figure 3.15 River bed reed and grass



Figure 3.16: River bed reed 'ikri' and grass



Figure 3.17: Brick and cement mortar

The design of the homestead caters to the family needs, occupation and size. The designs are such that they can be extended incrementally or modified over time depending on the context; are interconnected and flowing and thus foster a high level of interaction between people in the neighbourhood strengthening social networks; are comfortable keeping the homes cool in summers and warm in winters; they are aesthetic and reflect people's culture and art; is responsive to the climatic conditions of the region; flows seamlessly into community spaces; etc.



Figure 3.18: Living, sleeping and store room, kitchen



Figure 3.19 Verandah that doubles as kitchen and open space



Figure 3.20: Family unit with space in the middle fostering privacy as well as interactions

The designs and layouts of entire villages that grow organically over the years usually have a meandering layout and the streets and paths converge or at least lead to a community building – typically a temple, that would normally have a solid structure, deep foundations, thick walls and high roofs with several openings; or a common meeting space usually under a large tree. Houses are arranged, along these lanes, in a slightly staggered fashion both with regard to their location on ground as well as location of the main opening. As a result, the main entry of one house would normally overlook the open space of the house opposite. While this type of a layout has a strong social logic in terms of privacy when locating main entrances, or religious as in the case of the lanes terminating at the temple, there is strong logic also in terms of promoting a comfortable living environment with respect to movement of air, being visually pleasing, and enabling social interactions with one's neighbours²⁴.

²⁴ Mona Chhabra Anand, Architect, in a dialogue about village layouts with Radha Kunke

The construction of houses and the design of layouts also allow for trees and other natural elements – undulation, water bodies, water channels etc. to remain undisturbed.



Figure 3.21 : Ramnad, Tamil Nadu village settlement

The techniques and technologies range from the simple to the complex – simple methods of tying together various elements of structure (in a simple hut) to the complex systems and methods of habitat management and disaster response and reconstruction.



Figure 3.22: Roof Support



Figure 3.23: Bamboo joineries

People have responded to and developed simple and elaborate mechanisms to adapt to and deal with vagaries of nature over the centuries – whether it is the intense heat of summers, bitter cold of the winters, floods and disasters during monsoons, or even the unexpected large scale destruction through earthquakes. In a country like India, which is predominantly rural, people have enjoyed a relatively self-sufficient style of construction and living. It is clear that there has been a Built Environment Swaraj.

In the reconstruction context however, people have waited for the government to respond to their situation and to 'build for them'. This 'dependence' on the government and the idea that the government will 'solve' all problems has led to a variety of disappointments over different disasters. While sometimes they have been helped adequately by the external interveners, most often the people themselves had to finally get to the brass-tacks and deal with their problems themselves.

In the post-tsunami reconstruction in Tamil Nadu, once the reconstruction of the core-houses was over, people moved in and started to modify these houses according to their requirements. Additions were made in the form of kitchens on the outside, thatched roof pandals on the roofs, shelter for cattle, kitchen gardens, sit outs etc. They used those materials which lay as waste or materials still lying around for features left incomplete and also locally available natural materials.

In Gujarat, where people were given a choice by the government and funds were made available to them to build the way they wanted, reconstruction saw a variety of designs, technologies and materials. 95% of the people who opted to build their own house used artisanal methods. Yet, the people who opted for NGOs to build their houses asked for concrete boxes. The message there was clear. 'If you are going to give me money or spend it on me, yes, I would like to have a concrete box. But if I have the money in my own hands, I have other higher priorities than a fancy idea of a concrete roof.' (Sandeep Virmani, Architect, Hunnarshala)

One of the reasons frequently given by the implementers of reconstruction - government, contractors or NGOs alike - is the need for speed, efficiency and being cost-effective in the interventions. However, in contrast we saw that when people build themselves, they use local materials, reuse waste materials, recycle materials from their old homes and do this so that the cost of building a house comes down. The situation is the same during reconstruction. When people are given money to build their own house, they build it in the most cost-effective manner,

recycling and using as much materials as possible. This leaves them a little 'extra' cash which they utilize elsewhere. The speed of building also becomes remarkably faster. In Hunnarshala's experience - recounted by Sandeep Virmani in his interview on Sustainable Construction - in Jammu & Kashmir earthquake, the Government developed a policy and announced a scheme wherein if people completed their houses before the first snowfall, they would get an additional Rs.5,000/-. Seven thousand interim shelters came up in just 25 days. And by the time the snowfall actually happened, 20,000 shelters were completed!

3.8. Conclusions & Recommendations

Unlike other species which restrict their built environment to essential instinctual living needs, *homo sapiens* has architected a built environment around them to cover more than just survival and livelihood. An entire familial, community, economic and cultural edifice is sought to be created with the aim of living more comfortably, safely and meaningfully. As the planet reaches the tipping point in many fields like fossil-fuel-based energy, climate change, mineral based goods etc., it is quite clear that we have a built environment design failure on our hands.

Our environment is dirty and polluted – the air we breathe, the water we drink, the food we eat. Our living environments – homes, work places, leisure places – all are stressed to the extreme. Our poor and vulnerable live in conditions of extreme poverty, fear, and ill-health while our rich live in conditions of extreme luxury. Our post-modernistic architecture has become uniform, reducing every city to look alike, insulating people from nature completely. Our engineering has become more and more complex. Our technology has become more and more resource-hungry and consuming. Our construction industry that guzzles cement, iron and steel, bricks and stone, energy and water is responsible for 22% of the world's carbon emissions among other polluting gases. Our large scale 'creations' have created urban conglomerations and settlements that create vast divides between people, where it penalizes the vulnerable (the children, the disabled, the poor, the old) and rewards only those with material wealth with luxury spaces and products. And as we look around, we wonder is this the meaning of being comfortable, safe, productive and creative?

If success is to be measured in terms of achieving objectives, then the primary objective of built environment has been completely unmet and thus we have totally failed. For more than half of

the population on earth, life is neither comfortable nor safe nor productive nor enjoyable, while a majority of the rest leads an uneasy and uncomfortable life. And this is not even considering the other aspects of the planet including other living organisms on the planet – several of which are on the brink of extinction and almost all of them are under severe stress of contracting habitats – a direct result of human built environments.

With huge emphasis being given to issues of sustainability, especially in the light of climate change and especially as 22% of carbon emissions comes from the construction industry alone, the question of sustainability in construction is rapidly coming to the forefront. Many debates have been held, questions raised and solutions have been posited. Unfortunately most of these solutions have been “technical” in nature - sustainability in Built Environment has unfortunately come to mean either a technological response in “green” solutions or in an economic response in “low-cost alternatives”, both falling far short of the current requirements.

It is clear that though these may go a little way to solve some of the energy consumption / efficiency problems, it cannot possibly be posited as a *theory of ethics* in Built Environment. For real sustainability and ethical response to be achieved, we need to have major modifications in the mindset, in the attitude and the world-view of the stakeholders who engage with Built Environments. And this actually means almost every ‘stake’ as the built environment involves practitioners from every field: finance, materials, markets, design, planning, engineering, sociology, governance, law and so on.

With most of the decision making processes being taken away from people’s hands on one hand, and on the other, contradictorily, devolution and decentralization of powers through mechanisms like Panchayat Raj etc. happening, the message is confused and has led to more conflicts than solutions. What one begins to see is a larger pattern – where the decision-making powers of crucial and large-scale issues are taken away from the people into the hands of the few powerful stakeholders and at the same time the mechanical ‘implementation’ decisions of such centralised decisions are being devolved.

One also sees in this kind of dispensation a co-option of people’s organizations and other public-oriented systems into playing an implementing role in a manner that makes dissent almost impossible. The question of participation and democracy in such scenarios become directly a concern for the Manifesto.

Though Civil Society Organizations have played dynamic roles in development and more specifically in reconstruction, with CSOs being seen as the tenuous link between people and the government, their role is being fast diluted in the recent years. Despite the government's 'recognition' of the CSOs and investing them with a seemingly credible role of being an interface between the two i.e. the people and government, the positions are pretty much clear and lines have been clearly drawn – that the government, in collusion with stakeholders on its 'side' will be the final decision maker, with CSOs seemingly being able to influence their decisions to a certain extent. The People very clearly are the 'recipients' of these decisions and are given some apparent powers to decide within a framework already decided on behalf of them. The question then arises: do the CSOs see the long term patterns of co-option and being the uneasy 'partners' of such implementation?

In this kind of a scenario, the ideas like Owner Driven Reconstruction (ODR) seem like progressive decisions that have been made by the authorities. Yet, is the decision for ODR more to make large-scale reconstruction easier for the government? How genuine is its concern for an Owner Driven construction when the building codes and bye-laws in the mainstream are diametrically opposite and do not support traditional knowledge systems and people's design and architecture?

Initiatives like ODR also become ineffective when faced with reconstruction that comes directly as a result of technological, man-made disasters – like the Kosi embankments. Here is a case of a technology solution that has never been able to solve the larger problem in the first place and on the other hand, has only created an unmanageable problem that the local communities pay again and again for, through generations of being displaced, losing their lands and livelihood and homes.

The question of the seriousness of people's participation and knowledge comes to the fore when one sees that in the larger dispensation, especially in the educational institutions, formal academic institutions and the research organisations, such knowledge systems barely get a mention and sometimes are even dismissed as 'unsafe' and not useful, while at the same time the disastrous technology solution get perpetuated as the best. How does one reconcile such contradictions? The problem in the technological solution is because science posits a solution to a problem under either a controlled environment like a laboratory or to respond to a problem situated in a specific set of inter-related dynamics of people and environment. These solutions cannot be 'standardized' as the problem definition changes with even a minute change in the

dynamics of the inter-relations of the components at the ground level. However, locally arrived at solutions in response to a locally defined problem always comes trumps up in comparison. Yet, technology and science have always been posited as a solution at a “higher” and “larger” scale, which gets imposed at the ground however inappropriate it might be locally.

Under such circumstances, CSOs and their ‘alternative technologies’ and people and their traditional systems become severely crippled in the face of the juggernaut of ‘modern’ construction technologies that are either imported or are pushed and lobbied by technology monopolies. How is it possible for people’s knowledge to find its rightful place and who will make it happen?

It may not be possible to bring in ‘new’ thinking; however, what can be made possible is to change the process of problem-definition and to make the people directly involved responsible for defining the problem. Once the problem is defined appropriately and articulated directly by the ‘affected’ and there is a genuine desire to meaningfully intervene, an appropriate solution becomes a natural outcome. One has to be very careful in being able to balance the interests of the different communities and stakeholders and facilitate a process of dialogue. Hence one of the strongest principles in reconstruction has to be that the affected people, community, village, family will define its problem and arrive at solutions that are most suited to them. And this kind of an approach has to be a policy approach where the government very clearly plays a ‘facilitation’ role and leaves the decision making and implementation to the people. Traditional techniques, modern approaches, alternative technologies and materials, fusion approaches - all of these then become part of the reconstruction response, engendering a holistic, plural, sustainable approach.

Once the government, the scientific community and the CSOs are clearly seen as ‘facilitators’ and as providers of the support that is required to enable ‘good’ reconstruction, the dependence of people on these stakeholders reduces drastically, squarely putting the power and responsibility of intervention in their own hands. This automatically ensures quality, speed, efficiency, plurality, justice and sustainability.

Recommendations:

There is no separate sub-discipline that articulates Ethics in Built Environment. This needs to be opened for debate to enable an articulation of ethics based on plurality, sustainability, justice, *swaraj* and non-violence.

Reconstruction has pointers to what Ethics in Built Environment can be built upon. Learnings from reconstruction, the pitfalls and positive initiatives can become the basis for developing an overarching theory of ethics in built environment.

The larger policy decisions are being clearly being taken away from the people and are being made by the Establishment (government + expert combine) while the actual implementation of these decisions are being devolved as decentralized processes. This gap and trend has to be recognized and changed.

It is clear that when people build, their approach is different – they bring in plurality, sustainability, and justice. There is an urgent need to redefine “efficiency” to mean not only speed plus cost plus quality but also to include these elements. All the other stakeholders other than the People themselves need to play a facilitative role, providing support and other enabling factors. People need to be able to build for themselves.

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4. ROLE OF CIVIL SOCIETY IN SCIENCE AND TECHNOLOGY – EXPERIMENTS IN DEMOCRATIZING WATER SECTOR

Chitra Krishnan, M V Ramachandrudu and R V Ramamohan²⁵

This case study is divided into three parts. The first part gives the context in which this case study is prepared; broad framework of analysis (key questions) and the methodology. The second part examines three experiences in considerable detail. It discusses the S&T interventions, civil society involvement and the expert – layperson divide in these areas. The core concerns of Knowledge Swaraj – a manifesto – (viz. plurality; justice, equity and sustainability) are used as a basis for analysing the three experiences. They are also compared to understand the differences in democratic functioning based on the key questions. The third part of the report gives the details of lessons learned and concludes the case study.

4.1. Rationale for a Case Study on Water

With growing population, rising expectations of farmers and urban dwellers, changes in technology, shifting economic bases of populations, deteriorating water quality, changes in climatic conditions and priorities of successive governments – the water sector is becoming increasingly complex.

As in other sectors, Scientific & Technological (S&T) interventions are regarded as a panacea to many problems in the water sector. The constant call for grander schemes and improved efficiency of existing ones is a stark reinforcement of the dominant paradigm. In this kind of thinking the standardised, expert driven approach is unquestioned. A closer look shows that a range of technological interventions, once heralded as solutions to issues of supply and control of water, have floundered later. Despite this, the dominant paradigm adopted by the state has not been dislodged.

Civil society involvement in the water sector has shown alternatives to this dominant paradigm. Many civil society interventions have aimed at democratisation of the water sector, allowing for participation and representation by communities affected by / who gained from water projects.

²⁵ The case study leaders can be contacted at abcks5@yahoo.co.in, duram123@gmail.com and rvm2@yahoo.com. The case study acknowledges the inputs of Himanshu Thakkar, Dr Dinesh Kumar Mishra,

This means recognising their knowledge base and incorporating their world views. The process has not been linear or easy.

Given the complexity of the water sector, one pertinent question is this - Under what conditions and circumstances do civil society interventions work? When can the dominant paradigm be altered, when is it obdurate? This case study on water reflects on such questions, within the framework of the manifesto.

The framework of exploration and analysis of the water case study is largely derived from interpreting and contextualizing the core principles of Knowledge Swaraj - the manifesto on Science and Technology. This manifesto points out that a variety of forms of knowledge – scientific, scholarly and experience-based – need to be included in the design and implementation of projects. Many times failure of projects is largely blamed on external factors like - bad management or wrong political decisions. On the other hand, when a project/ scheme is designed based on accumulated knowledge of all types of sources/ groups, a variety of issues would have been incorporated in the project design (technical, social, economic, ecological, cultural and other dimensions) and such a project is likely to succeed.

Based on the experiences and engagement of the authors with the water sector, the following examples (themes) were selected for preparing the report.

- River Valley Development - Understanding Tungabhadra from a Common Citizen's point of view
- Ground Water Management – Social Regulation experiences of CWS and WASSAN
- Watershed Development Projects - Advocacy efforts by Civil Society Organisations (CSOs) in Andhra Pradesh

The study is an exercise in reflecting on the above three examples²⁶ through the lens provided in the manifesto, based on the author's personal experiences and studies in these examples. It restricts itself largely to the geographical region of the state of Andhra Pradesh (with a few instances in the neighbouring state of Karnataka).²⁷ All three themes (experiences) relate to a recent time period i.e. the last decade (2000 – 2010 A.D.). Characteristic of this period were

²⁶ In which the authors were directly involved.

²⁷ There are innumerable examples of Civil Society interventions in India's water sector and it would be impossible to do justice to all of them or generalise their lessons. Hence it was thought best to start with a few varied examples.

failing bore wells, drought conditions and highly developed river basins. These ground conditions formed the background for S & T interventions. The choice of these themes was also made based on the potential lessons that one could learn, from the perspective of CSOs and knowledge systems within CSOs. A detailed narrative of each of these three themes is presented in section 4.2.

The authors considered this as an opportunity to deeply reflect on the role of CSOs in water sector, based on the experiences of each member of the team. The nature of the enquiry did not necessitate any additional field work. However, informal consultations with experts on water sector formed an important basis for articulating the experiences of the team. The team asked itself the following key questions and explored answers from their own experiences:

1. How and by whom is knowledge created in the water resource sector?
2. How are policies and programs formulated in the water sector? What kind of knowledge base is used in the policy formulation processes?
3. Is the process of knowledge generation and utilization (for policy formulation/ programming/ executing/ resource allocation) based on principles of plurality, justice, equity and sustainability?
4. What is the role and contribution of CSOs in the process of democratizing the water sector?

The core elements of democratization process (justice, plurality, & sustainability – as articulated in the Manifesto) constantly guided the process of reflection and analysis of the experiences.

4.2. Narrative of the three themes

This part of the report first describes the three themes at some length, focussing on the S&T interventions and knowledge systems incorporated. After that, actors and their roles in knowledge democracy is analysed. Finally a comparative analysis of the three themes is made, to understand differences in democratic functioning.

4.2.1 River Valley Development – Understanding Tungabhadra from a Common Citizen’s Point of View

In the water sector, the technocratic worldview is most evident on rivers. Viewed as a resource to be harnessed, redistributed and “used”, the technocratic mindset has long taken refuge under the banner of ‘preventing every drop of water from going “waste” to the sea’.

However, river valleys are not blank slates to draw new lines upon – they are well populated regions providing livelihoods for people in numerous villages and scores of towns near its banks²⁸. Thus any intervention on a river has social effects. This qualification often invokes a second caveat – belonging to economics – that there will always be trade-offs, some lose but there is a much larger gain/ development for others. This notion can hold water only if the costs of developments are assessed carefully – else losses may exceed gains²⁹.

The two notions – one technocratic and the other economic – have been championed for six decades now, i.e. since Indian independence. It is illuminating to see how they unfold now on one river, the Tungabhadra, a medium size river in south India. The aspects of river valley schemes that could be considered are numerous – water user organisations and their working; inequity in water supplied to tail end areas of canals; institutional limitations/ reform of irrigation departments; industrial / municipal pollution of the river; municipal drinking water schemes dependent on river etc. However the viewpoint taken here is that of looking at planning, design and construction of new schemes- viz infrastructure development. It is here that the gulf between experts and “non-experts” is deepest. It is also the source of problems that follow the commissioning of new schemes – if “non-experts” are given no role in planning and prioritising the scheme then their interest and involvement in efficient running of the systems

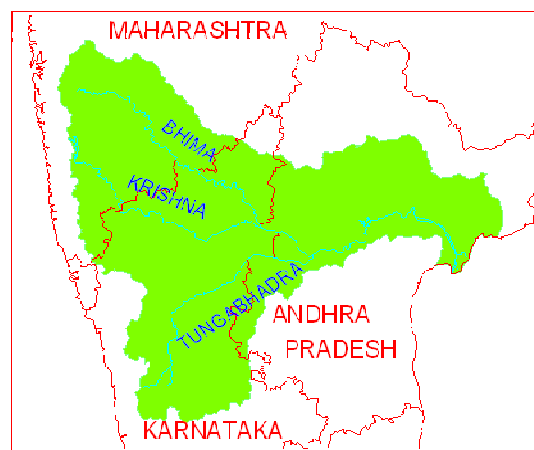


Figure 4.1: Map of the Krishna Basin with main tributaries marked

²⁸ Not to mention the endangered dolphins and other aquatic life which depend on the river.

²⁹ The social effects on riverine communities are complicated by another factor – a lot of the “used” water returns to the river in a polluted form. A fraction of water returns as runoff from irrigated canal command areas but now carrying dissolved fertilizers and pesticides. Water drawn for municipal water supply brings sewage laden flows from towns back to the river and industrial use returns effluents to the river. Thus river water quality declines and leads to health effects and fish kills. This complication is not dwelt on in the interests of simplifying the discussion.

will be low. They also have little or no role in maintenance and repair of schemes which consequently is also poor.

A brief description of the river and its behaviour will help to follow and appreciate the issues that come up.

1. Tungabhadra – A brief description

The Tungabhadra is the main southern tributary of the Krishna River and with a length of about 500 km is a medium-size river in peninsular south India³⁰. (The 1400-km-long Krishna River is almost the longest river of south India and its largely eastward course eventually drains into the Bay of Bengal.)

As is typical of all peninsular rivers, the Tungabhadra swells with the monsoon flows and is very subdued in the non-monsoon period. Its flow is thus not uniform but highly skewed. This is vividly evident to those who live along the river. Sometimes the river flows to a depth of 30 ft but most of the year its depth is less than 5 ft. Figure 2 plots the daily flow over the course of one year. As evident from the figure, for almost 80% of the year the flow is comparatively low (about 0.12 TMC/day). But in the monsoon it can rise almost a hundred-fold to 12 TMC or more per day.

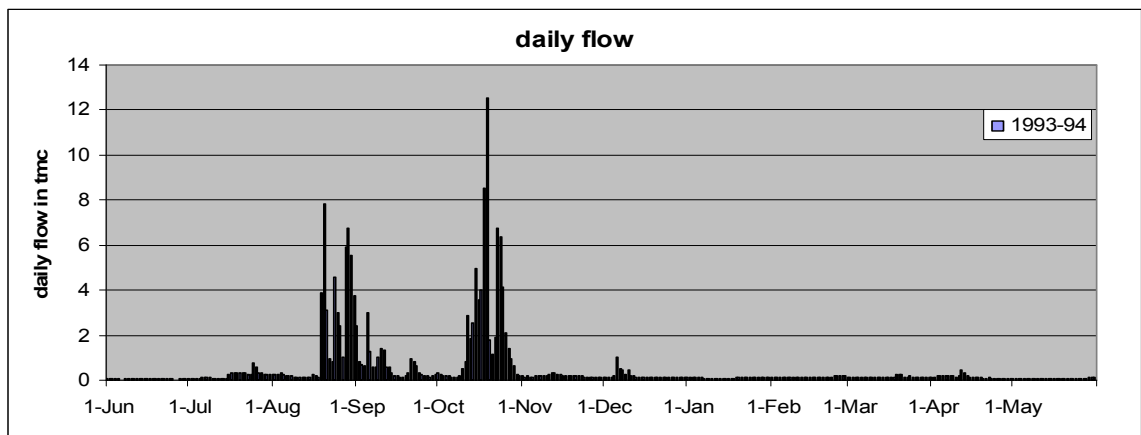


Figure - 3.2: The skewed daily flow in peninsular rivers like the Tungabhadra

³⁰ It is an inter-state river with about 70% of its length in the state of Karnataka. It then forms a border between Karnataka and Andhra Pradesh, and the rest of it lies in Andhra Pradesh where it joins the main river, Krishna.

When water has to be diverted or stored, a barrier/ wall are built across the river. These could either be dams or anicuts³¹. However, the river, being a dynamic entity, reacts to any intervention made on it. Any barrier (even a low one) built across a river has immediate and long term repercussions. It raises water levels upstream of the barrier and traps sediment there. This in turn leads to erosion downstream. Water levels are affected immediately while sediment effects become visible over decades. Sedimentation leads to loss of storage capacity in dams while in barrages/ anicuts, it can render the structure ineffective by blocking flow from entering its canal. Thus the river is negating the imposed barrier by filling it up with sediment and eroding river bed levels downstream.

So a new project on the river will often raise the water levels during the monsoon flow by blocking free passage and reduce the low summer flows even more by holding it back. Communities living upstream of the barrier experience higher flood levels in the monsoon while those living downstream of the barrier face greater scarcity in summer. Thus it will aggravate the situation for the local population both in monsoon and in summer.

;4.2.1.2 Citizen's experiences on the Tungabhadra

Like many other rivers, the Tungabhadra has seen its share of conflicts over the past few decades. Violence is not unknown. In 1990, one structure³² was damaged in a bomb explosion and there was violence between upstream and downstream users. In the 1980s and 90s industrial pollution of the Tungabhadra at Harihar, Karnataka led to conflict between citizens and state and industry. As river based schemes increase and irrigation infrastructure deteriorates, water conflicts on the river can be expected to increase. The details of a recent conflict, as evidenced by the local citizens there, indicates how conflicts are addressed and governed.

Since the 1990s, policies for renewable energy have been formulated by many states – these have included wind, solar and mini-hydel with targets set for each. The technocratic rationale for setting up mini-hydel projects on rivers is to meet these targets set for renewable energy generation – ostensibly a very desirable goal. In this effort private sector participation has been

³¹ Anicuts (as also barrages and weirs) are low barriers (10 to 20 feet high) that are “run-of-the-river” schemes which divert a small fraction of the river’s flow into a canal. There is hardly any reservoir created behind the anicut unlike dams which are high barriers (~ 100 ft high) with a large storage reservoir behind them.

³² Rajolibanda anicut

encouraged by the state. So it was, that in the middle reaches of the Tungabhadra river, near the village of Sugur (in Karnataka) a 4.5 MW mini-hydel power plant costing about Rs. 20 crores, was allotted by Karnataka State to a private developer in 2002. The allotment letter given by GoK stipulated as many as eleven conditions. Among them were the following:

“For no reason should the height of the anicut³³ be increased.”

“It should be ensured that farmers and public should not be caused any trouble by the setting up of the mini-hydel plant.”

Soon after, precisely the opposite happened. Construction began in 2003 and continued for one and a half years. During this time the anicut was raised by 14 ft. Public authorities (Irrigation Dept officials and District officials) allowed this to happen and offered no objections. (A 14 ft rise would increase the water level upstream correspondingly - during high flows in the river).



Figure 4.3: The unauthorised construction across the Tungabhadra near Sugur village (Source: www.bhinda.com 2004)

However, during the construction, farmers in neighbouring villages were apprehensive. They expected trouble when the river would flood with monsoon flows. Their enquiries were brushed aside by the private company stating it to be a Central Govt. scheme. Finally, when it was nearly ready, an empowered citizen petitioned the highest authority in the district – the District Commissioner (DC) – stating that due to raising the height of the anicut, three villages upstream were likely to be submerged during the monsoon flood flow in the river. The villagers were of course unaware of the contents of the allotment letter, since it had never been shown to them³⁴.

As anticipated, hundreds of acres of village lands did get submerged in August, during the monsoon flood flow, and standing crop was lost. Then, the Irrigation Dept Engineers, inspected the area twice in six months and gave suggestions to the company. An year after the construction, the Chief Engineer even recommended to the Secretary, Water Resources, GoK,

³³ In this case the site for the mini-hydel plant is an old Vijaynagar era anicut built in the sixteenth century. It has not been in use for many decades.

³⁴ The allotment letter became public only because of an RTI application by the citizen. That's when the locals realize that the “raising” of the anicut is unauthorized.

that the approval given to the company be *cancelled* as it had not followed the conditions imposed in the approval letter and had been careless. But no action was taken on this.

When flood flows again submerged the standing crop the next year, the citizen, finding no action taken, filed a petition in the High Court accusing

“Several public authorities of having colluded with the company, choosing not to act to implement Government orders and their own orders and except assurances and meetings, no action was taken ”.

The next two years *again* brought inaction, flood flow, submergence and crop loss. It is then that some villagers resorted to direct action and started dismantling a part of the unauthorized construction. Subsequently the Irrigation Dept. and later the company dismantled most of the unauthorized part. Here too there was a twist. It was not brought back to its original height but left a few feet higher. In all this time no compensation was given to the farmers for their crop loss. (The case is still in court)

Justice for the farmers was elusive as the public authorities failed to enforce their own orders. However it is not that public authorities stood mutely by. Over a period of four years, instigated by letters and petitions from citizens, the Irrigation Dept and District Authorities did try to fight for justice³⁵.

The DC met the company twice to discuss ways to mitigate the flooding. He even held a meeting a year later, ordering the Irrigation Dept Engineers to demolish the unauthorized construction with the support of police officials. But, apart from transferring him to a different district, no action was taken.

What becomes clear in this case is that no amount of petitioning various public authorities ensured any change in the ground situation – these resulted only in committees and meetings and orders issued but no enforcement. Thus local public authorities (i.e. district authorities) were powerless to ensure compliance of the state’s own orders in the allotment letter (that “For no reason *should* the height of the anicut be increased.”) This would be because those higher up in the state hierarchy do not wish enforcement.

³⁵ Yet, it cannot go unremarked, that all through the construction period, *when the anicut height was being raised unauthorisedly*, they raised no voice at all.

This case shows that the technocratic worldview operates in an arena where no prior information is given to the affected population and no discussions held with them. Further there is unauthorised construction and no enforcement of rules by the state. All this breeds injustice and begs many questions – is it in fact an unviable project economically and therefore the project affected population is kept in the dark? Is the technology, which ought to be built under conditions given in the allotment letter, unviable under those conditions? Or is the issue just one of poor governance? Or does it relate to more fundamental problems with society, knowledge and technology?

This case is not an isolated one. A sample of citizens' experiences (in the middle reaches of the Tungabhadra), over a recent five year period, show that there are other such cases (See Table 4.1).

Table.4 1: The Tungabhadra River : A sample of Citizens' experiences between 2003 and 2008			
Sl. No.	Location &Years	Cause	Response by CSOs
NEW SCHEMES			
1	Allipur village, Bellary District, Karnataka , 2004	Submergence of village by new scheme but no compensation or rehabilitation	Villagers, ex-MLA
2	Sugur + 3 other villages, Bellary and Koppal Districts, Karnataka, since 2004	Land submergence by illegal construction on river	Farmers
3	Rajolibanda, Raichur District, Karnataka 2004-2008	Flow to existing scheme denied by new scheme	Opposition MLAs, Media, Farmers
4	Pusala village, Bellary District, Karnataka since 2006	Flow to existing scheme blocked by new scheme	Farmers
EXISTING SCHEMES			
5	Tungabhadra Left Bank Canal, Raichur District, Karnataka, 2004	Neglect of repair of main canal	Farmers
6	Davanagere District, Karnataka, since 2004	Defunct lift irrigation schemes	Farmers

As the table indicates, not only are problems created by new schemes, existing schemes too cause problems either because they go defunct or are not maintained. The obligation of the state – to pay compensation, prevent illegal construction, illegal operation and maintain existing schemes are the grounds on which citizens have had to take on the state. Since projects continue to proliferate such problems are bound to increase.

4.2.1.3 Enacting expertise

A range of experts are involved in water projects on rivers. Technical and administrative experts are needed in planning and design, approving and clearing, implementing and finally operating water projects. In river valleys, the state continues to have a large presence. State departments, principally the Irrigation Dept, the Pollution Control Board, the Renewable Energy Dept and City and Town municipalities are influential actors with expertise. Consultants and developers from the private sector also bring in expertise during the designing, implementing and operating stages.

If the cases above are representative, then it indicates that all these experts show no critical self-reflection or know the limits of their expertise³⁶. Even if they did, they appear to have no independence to express their views or influence decisions. Further, in ignoring their defined roles and being unfaithful to their own rules, they encourage injustice. If the expert has no autonomy and can easily be co-opted by industry or the state then his/her expertise is of little value.

Can such a scenario be changed? The details of the mini-hydel case came to light only because the affected farmers petitioned the state and took it to court. This is not possible every time, since the affected communities are generally in the unorganised sector like fishing and farming. It is unlikely that they can hold out for long periods or engage in sustained lobbying with public authorities or industries. Only if transparency in decision making is brought in will there be pressure on the “experts” to at least adhere to norms.

We must recognise that the “experts” are under considerable pressure to toe the dominant paradigm. If consultants are honest about the negligible benefits of their project design, based on actual ground conditions then their own livelihoods become unstable. If a project is shown to be unviable or useless then the targets set in the irrigation policies or renewable energy policies will not be met. The technocratic worldview will be disturbed and then difficult to justify at the higher political levels³⁷.

This is not to claim that all water projects on rivers are useless. It is to recognise that as the number of interventions on a river increase – the benefits from new projects become more and more questionable, even seemingly benign ones like mini-hydel projects. It is also to recognise,

³⁶ For the mini-hydel case described earlier the following questions are pertinent. Did the technical design experts insist on increasing the height of the anicut by 14 ft? If so, why did those who cleared the project pretend that the anicut should not be raised? Even, late in the day, when the Chief Engineer recommended that approval to the company be cancelled, why was no action taken?

³⁷ Apart from these are the financial incentives of ensuring a project goes through, i.e. the kickbacks.

that when it comes to river projects, development comes at a high cost. Every new project creates a new marginalised group – the project affected community. There is injustice done to this local community and the state here is ready to battle its own people. The gulf between dominant and marginalised actors is very wide, because the scale of technologies promoted brings in powerful financial forces. How indeed can the river dependent “citizen” converse with the “engineer” on choices of priority, policy and ethics?

4.2.1.4 Sustaining infrastructure

In order not to single out new projects/ mini-hydel, it is pertinent to examine some of the large irrigation systems established in the 1950s and 60s on the Tungabhadra.

For centuries, the river has been harnessed for irrigation. Apart from pre-colonial anicuts, two anicuts were built in the colonial era. However, it is the post-Independence period that brought dramatic changes to the river – the dams. Until 1950 there were no dams on the Tungabhadra but by 1960 two large dams and one more anicut had come up. The two dams could generate hydel power and hold back close to half the river’s annual average flow.

Figure 4.4 shows the location of dams and anicuts built on the Tungabhadra. A number of anicuts belonging to the medieval Vijaynagar era still function. The other four anicuts are the Tunga, Bhadra, Rajolibanda and the Sunkesula anicuts. Unlike anicuts, which are only 10 to 20 ft high, the two dams, Bhadra and Tungabhadra, rise 194 ft and 116 ft above the river bed.

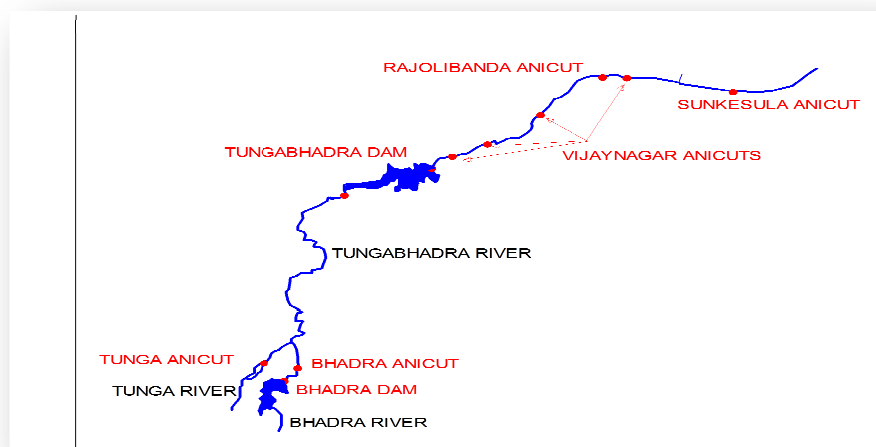


Figure 4.4: Location of dams and anicuts on the Tungabhadra river

Each of the anicuts feed a canal while both the dams have multiple canals to feed (Canals are not shown in the figure). We consider one of these canals, viz. the Tungabhadra Dam's Left Bank Canal (TBLBC)

This canal, completed in 1963 is 225 kms long. Unless regular maintenance is done, the carrying capacity of canals reduces as they get silted up. This makes adequate and timely delivery of water in the main canal impossible and in about 30 to 40 years the canals need major overhauling.

Thus by the late 1990's the poor condition of the TBLBC led to frequent breaching of the canal and disruption of supply. Farmers dependent on it made representations to every political leader coming to the area including the Chief Minister, but it was of no use. After a particularly poor performance in 2003 and no sign of repair work being taken up, farmers held protests and dharnas along the canal in the summer of 2004.³⁸

Appealing to the farmers to call off their agitation, the Water Resources Minister decided to take up fresh tenders for repairs in May. Canals should be repaired when there is no flow in them, typically between March and June but it was July 2004 when repairs for Rs 9 crores were taken up in the TBLBC. Within two weeks the money was spent - this *included* a ten day delay due to heavy rains in July.

Later that year the issue of repair of TBLBC was brought up in the State Assembly by an opposition party member. He wanted to know why the government was yet to find a permanent solution to the breaches in the canal. The ruling party responded that the Rs 680 crore needed to rehabilitate the canal could only be released in phases. In reality the state govt is able to annually allocate only 1 to 2% of this amount.

The problems with this canal have been much diagnosed. In fact proposals for repair of the canal had been submitted separately by four different public authorities – the Irrigation Dept, the Tungabhadra CADA and the district administrations of Koppal and Raichur Districts - many years earlier. Yet the Karnataka State Govt appointed another committee in 2005 to inspect the canal and come out with recommendations to improve the canal.

On one hand maintenance and operation of irrigation systems demand huge finances. State Govts themselves do not have adequate funds for this yet new project continue to be taken up.

³⁸ Mollinga (1998), in his study on irrigation water management on the Tungabhadra Left Bank Canal points out that the paddy growing farmers' lobby is very powerful, economically and politically and all state governments in the past have yielded to it. This is true when they exert pressure to delay closing of the canal to ensure their water supply but when it comes to repair and maintenance, they appear not to be very influential.

On the other hand the limited funds released for maintenance are misused by hasty repairs at the wrong time.

Canal maintenance is not the only worrisome factor, the anicuts themselves have needed to be abandoned and new ones built. The Sunkesula anicut underwent major repairs in the late 1950s but in 2003 a new barrage was built just downstream of the old anicut. The Tunga anicut built in 1956 was submerged when the Gajanur Dam built just a hundred meters downstream of it was ready in 2005. The Rajolibanda Anicut which was commissioned in 1962 will be as good as abandoned if the mini-hydel plant sanctioned just upstream of it comes up. Are we then to take it that anicuts have a life time of only 50 years or so and that they will be submerged by the new structure built just downstream of it? An anicut or barrage today costs about a hundred crore rupees to built. Is it permissible to let them be abandoned in 50 years? Is there no alternative?

As mentioned earlier, silting is a serious problem on dams, anicuts and canals. Anicuts can be rendered ineffective due to excessive sedimentation. As one engineer writing about an anicut in Tamil Nadu in 1950³⁹ put it

'the Tirukkoilur Anicut across the Ponniyar is typical of a class of problems met with in this province. The anicut has silted up almost to the crest in the course of years and it overflows only 40 days in a year. There are canals taking off at either flank but owing to heavy silting up of the upstream and the consequent absence of storage, supplies could not be maintained to the canals.'

However, on the Tungabhadra, a dozen anicuts of the Vijaynagar era, built 500 years ago are still functioning⁴⁰. What explains their longevity? It turns out that these traditional anicuts were curiously shaped, unlike the anicuts of today. A British Engineer writing about traditional anicuts of south India (which he called native weirs) remarked in 1873⁴¹

"nearly all (native) weirs were designed in curves, or a series of curves in greater or less imitation of the forms assumed when water crossed a natural shoal or hard in the bed of a channel. On the other hand Madras Engineer Officers for the most part rejected this theory, and adopted straight, level, and perpendicular outlines in their constructions. One of the advantages possessed by the native system was, that the curved surfaces of the crest of the weir allowed the water to pass over more easily;Another advantage possessed was, that owing to the greater velocity at the depressed portions of the weir, the sand and silt brought down from the up-country were passed over the weir instead of being allowed to accumulate in the bed of the river on the upstream side."

³⁹ Anon in Annual Report of Central Board of Irrigation and Power, 1950

⁴⁰ They may have been modified but none has yet needed replacement like the Tunga and Sunkesula anicuts.

⁴¹ "In Discussion on the paper by Col. W.H.Greathed, On the Practice and Results of Irrigation in Northern India," by Godsmann, J.G.C.C., (1873), Minutes of the Proceedings of the Institution of Civil Engineers, Vol. 35

There were hundreds of such anicuts on the Tungabhadra. As recorded by Major Sankey in 1866 AD, there were 250 such anicuts with 580 kms of canals in the Tungabhadra and its tributaries in the princely state of Mysore.⁴² What has happened to all these anicuts ? Did they represent an alternate irrigation design legacy that the dominant paradigm has brushed aside unexamined? Could they be alternatives to the short-lived anicuts of today? The question has not been looked into.

Marginal spaces

The cases on the Tungabhadra indicate that on river projects, the techno-economic world view continues to hold sway over the decision makers and the general public. In the first few decades after Independence, they were justified as increasing irrigated area, now the emphasis is shifting to hydel power generation as part of infrastructure development. A further impetus comes with climate change abatement efforts, wherein hydel power is viewed as a low carbon pathway to energy demands. So, more projects on rivers can be expected - even if they deny the flow needed for existing schemes.

Peering closely into the unfolding of the techno-economic criteria shows it to be riddled with faults, the principle ones - being poor design assumptions and violation of rules during implementation. Waste and erasure of anicuts are seen, but over a period of decades. Canals need overhauling within 40 years of being commissioned. More importantly though, there seems to be no space for ethics. Decision making is a closed affair – how priorities are set and plans made is opaque.

Yet it can't be entirely secretive – engineers, administrators, consultants and financiers would be aware of many of the details of the plan and of the inefficiencies and malpractices in implementing and sustaining the infrastructure. There may be dissent in these ranks too. In one case on the Tungabhadra, a Govt. appointed technical expert committee, comprising of Chief Engineers, advised against a new scheme but was ignored by political leaders, so great is the momentum in favour of new schemes. This reminds us of a hierarchy in these ranks with political leaders apparently at the helm, supporting industry.

The need for a vigil by civil society is compelling. Because (i) the supply side growth-oriented paradigm is leading to violation of norms, (ii)“experts” are co-opted and (iii)funds for maintenance are meagre and misspent there is a need for alertness by civil society. If each affected river-dependent community has to struggle on its own then little change can be

⁴² From “Letter to the Secretary to the Commissioner for the Government of the Territories of his Highness the Maharaja of Mysore”, by R. H. Sankey, 1866

expected. The beneficiaries of hydel power and water supply live in cities and towns and ethically, their responsibility in the struggle for transparency cannot be overlooked.

One rallying point could be the health of the river. The flows in the river over the last four decades could be analysed for trends, but this requires persistence to locate the information. (State departments hold the monopoly over such flow data.) The cliché that ‘not a drop of water should go waste to the sea’ needs to be rejected in favour of insisting on a minimum flow at **all** times. Finally, at the very least, civil society involvement could help increase expertise – the kind needed to understand and follow discussions.

All these marginal spaces must grow.

A national watchdog

If the need for civil society involvement is granted, how is it to be organised - around particular projects or around rivers? Since water is a state subject, what could be the value of a national watchdog? Fortunately, the question is not purely theoretical since a civil society organisation, South Asia Network for Dams, Rivers and People, SANDRP, has taken on just such a role for over a decade now.

SANDRP’s role in monitoring, research and building awareness about issues in the water sector, especially relating to large dams in India is a pioneering one. It publishes a journal called Dams, Rivers and People and maintains a website which disseminates its research findings. Responding to current events, their research makes very specific demands for transparency and accountability in the water domain. In what follows, the gist of its arguments for various cases is presented. It brings up many other issues that did not come up in the earlier sections.

Accountability in existing projects

SANDRP’s analyses of floods in recent years in Gujarat and Orissa and a dam failure in Rajasthan, showcase the lack of accountability in the operation and maintenance of existing dams. Gujarat’s Ukai dam and Orissa’s Hirakud dam, both have a “flood cushion” i.e. an amount of storage that is not to be filled till the end of the monsoon, viz. early October. But these “flood cushions” were already filled in August/ September. Hence when the floods arrived, the dams, instead of moderating the flood, released large flows downriver. In Rajasthan, the Jaswant Sagar Dam’s collapse in 2007 came as no surprise to the dam authorities. The State’s Dam Safety Committee suggested removal of defects (viz erosion of downstream area and signs of

cavitations developed in the dam) as far back as 1996 during a World Bank funded project then. Instead of removing these defects the department incurred avoidable expenditure like renovating a road and buying a diesel engine and generator, as per the Comptroller and Auditor General's report of 2001.

The breach in the Kosi embankment in 2008 resulted in widespread destruction in Bihar. Writing to the Kosi Inquiry Commission that had asked for submissions in 2009, a member of SANDRP pointed out that officers of the Ganga Flood Control Commission, GFCC, under the Union Ministry of Water Resources, must be held accountable. As per GFCC's annual report, they monitor the maintenance of flood protection works of Kosi and Gandak Projects in Nepal portion. Lack of maintenance of this area led to the breach of 2008⁴³.

Transparency in new projects

While accountability in existing projects is vital, it is new projects that have engaged SANDRP's time substantially. As they argue, this is because of recent attempts of the Govt of India to accelerate the pace of dam building. Large dams under the Hydropower initiative (for 50,000 MW) are either on the anvil or under construction in Himachal Pradesh, Uttarakhand, Sikkim and the North Eastern States. The Bharat Nirman project initiated in 2005 funds more large dams for irrigation and the ILR (Interlinking of Rivers), needless to point out, also pushes for large dams.

"Who takes decisions for large Dams? How? Why? Who profits? Who pays? Many questions, few answers" is the title of one of SANDRP's articles. Yet some of the "few answers" come from their own efforts.

Although water is a state subject and projects are planned and designed by each state, they need to be cleared by the Centre viz. the Central Water Commission (CWC), Planning Commission, the Public Investment Board and the Cabinet Committee on Economic Affairs. It turns out that more than 60 % of major and medium irrigation projects under implementation are unapproved by the Centre, as per a report of Union Ministry of Water Resources in 2006. Instead of calling for penalties, the Report argues for the clearances to be given thus allowing

⁴³ Several other arguments are also made in detail, like the Director of GFCC writing urgent letters to the Bihar Govt asking for estimates and schemes and monthly physical and financial progress reports of maintenance in 2008 but doing nothing else when lives, livelihoods and safety of crores of people was at stake etc.

for release of central funds for early implementation. SANDRP points out that this unveils the fact that central agencies rarely disapprove a project.

Currently the one instrument for allowing public participation in large dam projects is a public hearing. For a Hydropower project in Himachal Pradesh funded by the IFC, the private sector arm of the World Bank, SANDRP helped the affected people in preparing, submitting and following up a complaint to IFC in 2003 and 2004. That complaint points out that although (under pressure from people's demands) two public hearings were held, neither proved useful for making an informed opinion of the project. Before the first public hearing they did not have the Environment and Social impact Assessment (ESIA) report in Hindi, the only language most of the people understand. In the next public hearing, when the ESIA was available in Hindi, they realised how inadequate those assessments were and made the same clear to project authorities in various ways. Despite repeated requests the IFC did not address the inadequacies of the ESIA. The complaint also points out that the IFC did not follow its own guidelines and policies on Disclosure of Information, Environmental assessment and Involuntary Resettlement. Thus the World Bank is another player that continues to push for large dams, *in violation of its own policies and norms*.

These cases, brought to light by SANDRP, again indicate violation of rules and norms – in operating reservoirs, dam safety repairs and maintaining flood protection works; in different states of the country. The Centre appears to be unable to enforce rules, as with the Ganga Flood Control Commission which resulted in the breach of the Kosi river embankment. Moreover, the Centre, clears all projects from the states, when it is in fact in a position to withhold clearances if norms are not met.

Are we then led to surmise that the basic problem is one of mis-governance? Is the Indian State too soft, yielding to pressures from various bodies, unable to enforce rules and thus allowing rampant breaking of norms? A little consideration will show that the malaise runs much deeper. It is not restricted to the Indian State. As the Alain- Duhagan instance shows, the lending arm of the World Bank (IFC) itself is susceptible to the very same problem. In pushing the Alain Duhagan project they violated their own rules and norms. So we are dealing with a more fundamental problem - with knowledge and technology, connected to an underlying rationale – never actually stated – “development/growth at *any cost*” – that rules projects in river valleys.

Various attempts at reform – like privatisation, regulation, creation of Water User Associations etc all are circumscribed by this underlying rationale.

In contrast to river valley projects, other areas of the water sector have allowed for more democratic S & T involvement from civil society as the following two themes show.

4.2.2 Ground Water Management – Social Regulation experiences of CWS and WASSAN

When public infrastructure fails to provide water (for irrigation and drinking water purposes), individuals have to find out a way to protect their crops and lives. Ground water is the natural option for many farmers in rural areas now⁴⁴. About 50% of irrigated area is being irrigated by ground water now. More than 70% of habitations depend on ground water for domestic/ drinking water purposes in Andhra Pradesh. The advent of bore wells facilitated this process of privatization of ground water. Though theoretically, ground water belongs to state, for all practical purposes ground water is a private property. Those who have financial resources could easily dig a bore well and access the available ground water. This open access system has encouraged individuals to extract ground water without a cap on the quantity extracted often creating competition and conflicts amongst users - rural and urban.

This competition has led to erosion of ground water resources and has reached “point of no return” in many villages. In hard rock areas of peninsular India, many farmers have become indebted due to the huge private investments on drilling bore wells.⁴⁵ While uncertainties in striking groundwater fractures in hardrock areas is the primary reason for failures of many new wells, competitive drilling at very close distances is a major cause of functional wells going dry. Water extraction surpassed recharge potential and the “renewable” nature of water is slowly changing. Several villages are reeling under severe man induced drought and severe water scarcity as a result of seasonal fall of groundwater levels aggravated by increased well density. There are water wars already in the agriculture fields between farmers, who could incidentally be brothers. Andhra Pradesh Water Land and Trees Act (APWALTA) has provisions to regulate

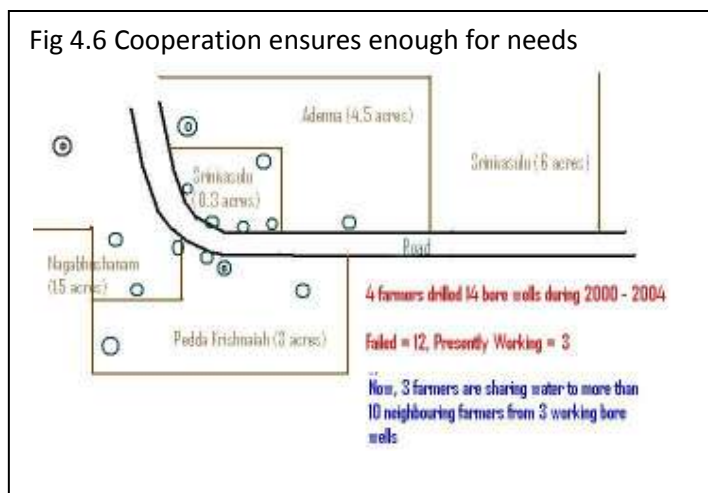
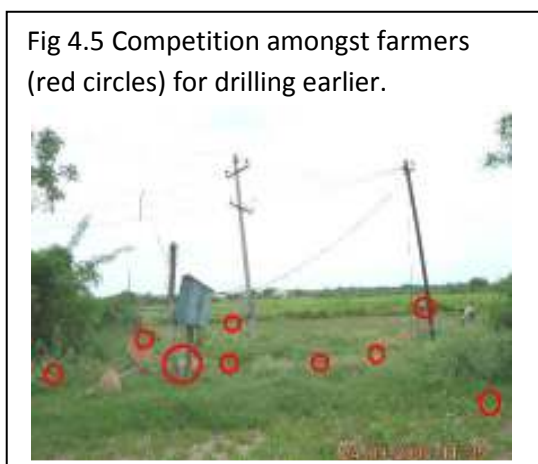
⁴⁴ Ministry of Water Resources, Government of India. 2001. 3rd Census of Minor Irrigation Schemes.

⁴⁵ Sainath. P. 2004. Sinking borewells, rising debt. *The Hindu*. 23rd June. Sainath speaks about a village with more wells than people. <http://www.hinduonnet.com/2004/06/23/stories/2004062303171200.htm>

well spacing and over-extraction but has no space for the community to play a pro-active role in managing groundwater. The notion that systematic knowledge generation and assimilation will help to evolve community level regulations has been tried in a few micro level pilot projects initiated by Centre for World Solidarity (CWS) and WASSAN.

The pilots implemented by Centre for World Solidarity (and its partners) and WASSAN (and its partners) demonstrated that ground water could be converted into a “Common property” and every member in a given village could have a right over the ground water. If facilitated, communities come forward to actively engage and generate new tools and knowledge. Farmers invented ways of “sharing” this precious resource among various members in a harmonious and equitable manner. However, this was not simple for these organizations to facilitate such alternative approaches building on the knowledge of the farmers. The macro policy environment and support structures are the first hurdles to cross when farmers take this untreaded path.

CWS was exposed to the complex nature of water resources management and governance because of their long experience in implementing natural resources management projects in different parts of the country. CWS recognised the implications of over dependency on ground water and initiated “community based governance systems for ground water”. CWS believed that programmes of water literacy and “social regulation” of ground water use by all villagers could help overcome policy limitations and increase community acceptance of laws that insisted on regulating and spacing borewells in AP.



CWS was also conscious about the need to address the water requirements of non-well owning farmers too. CWS developed effective partnerships with like-minded grass root level NGOs. Jana Jagruti, RIDS, Nava Jyothi and CROPS working in drought prone districts of Andhra Pradesh (Anantapur; Medak and Warangal). The work started in 2004 in 4 villages, and gradually expanded to 19 villages in 5 districts of Andhra Pradesh by involving 4 more NGOs (like Praja Abhyudaya Samstha, REMEDE, SAVE and REDS). The village is taken as a unit for facilitating water management and Panchayats at an early stage for planning of the activities.

CWS and these NGOs organized series of meetings and exposure visits in the selected villages. They conducted situational analysis along with communities and the focus was on water resources in the village and related livelihoods (drinking water; agriculture; water for animals, etc). The renewable nature of water, distribution of water; quantity & depth of ground water; water requirement with respect to various crops in the village and energy requirement for pumping water were discussed in these meetings. Community volunteers and farmers were involved to gather data on groundwater levels, rainfall and cropping on a seasonal basis. Failure of wells and their reasons were discussed in detail analysing causes and effects. The dominant paradigm of continued individual investments to drill new wells irrespective of losses from failures was juxtaposed with existing traditional systems of sharing surface and groundwater resources in these villages⁴⁶. A systematic understanding of this logic resulted in developing “new methods and approaches” by farmers as alternatives. These processes lead to the realization that “cooperation, rather than competition” is necessary to over-come the crisis.

Though they all agreed that ground water is precious and there is a need for controlled use of the same, the initial operational steps were not very clear or visible to them. CWS and NGO partners proposed that sharing ground water by well owners with those who do not have wells or lost their investments due to failure could be the way forward. As APWALTA restricts drilling new wells within 250 m distance of existing well, this is a more practical solution to ensure equitable access to groundwater to all. This proposal essentially avoids new investments on bore wells at the same time ensure access of groundwater to all. Though it was not agreeable to many farmers, particularly to owners of bore wells, slowly they started realizing that their wells are protected against future failures as the neighbouring receivers of water agree not to drill new

⁴⁶ Water to People – Drinking Water and Water for Livelihoods, Uwe Hoering, published by EED and Water and Democracy Initiative / CWS, April 2008

wells in the vicinity. This emerged as an “incentive” to those well owners for coming forward to share water with their neighbours.

As a further incentive to bind these groups of 2-3 farmers, CWS and partners offered them “sprinkler and pipes” as a group asset. CWS and partner NGOs could access the funding support from Andhra Pradesh Micro Irrigation Project (APMIP), an on-going scheme of government of Andhra Pradesh and ensured that the willing farmers got the sprinkler sets from this scheme. Though this scheme does not offer sprinklers and pipes for groups of farmers, formal agreements at the group level and advocacy with APMIP helped to change the rules and accommodate the receivers also as potential beneficiaries in the scheme. This scheme requires that farmers have to meet 30-40% of the cost of the sprinkler set. ‘Sharing groups’ contributed 20% of the cost and remaining was provided by the NGOs to those farmers, who agreed to share water with neighbouring farmers. Considering this support, a first group of farmers was formed, in which all members got irrigation water. Only one of them owned a bore well, who agreed to share water with others in the group, who do not have bore well. The sprinkler set (including pipes) not only facilitated the sharing of ground water among the members but also helped to save about 30-35% of water. This group started a new culture in the village. All other farmers watching this process soon realized that no one is losing and everyone could gain in this process. The cost of maintenance of the bore well was agreed to be shared by all members, not just by the owner. Those farmers who do not have bore wells agreed not to dig any new bore well. This promise by them gave a new confidence to the bore well owners and their investment is secured now.

The sense of benefits and incentive (in the form of sprinklers and pipe sets) for sharing propelled the process of sharing of ground water by more number of villagers. Slowly more groups were formed in which bore well owners agreed to share ground water with those who do not have bore wells. All these villages have slowly shifted to collective use of ground water within the groups. During this process, they also decided that they would not dig any new bore wells in the village. All existing bore wells are used by respective bore well user groups. There was a decisive shift towards water use efficiency and changed cropping pattern in the village. Irrigated dry crops, mixed crops became a common practice in the village. In some of these villages, the conservation of rain water was also introduced by taking up watershed development projects. Efforts were made to ensure that all households got drinking water in the villages. These initiatives established a new reality that villagers have agreed to socially

regulate ground water to ensure that all villagers got water not only for irrigation, but also for drinking purpose. The ground water is used in a sustainable manner in the entire village and all families/ farmers got access to precious ground water.

Over a period of 6 years during 2004-2010, about 300 'sharing groups' emerged in 19 villages spread in 5 districts of Andhra Pradesh. Around 350 farmers who do not have wells could gain access and secure their rain-fed crops in 400 acres of land. Shift from water intensive crops (like paddy, sugarcane) to water-saving crops (maize, sunflower, vegetables) and use of sprinkler systems helped to "save water and share water" to 350 farmers, without extracting additional water from the aquifers. Energy related interventions, such as fixing capacitors to pump-sets; re-alignment of feeder lines from transformers; motivating farmers to regularize unauthorized connections; and upgrading transformers by the distribution company resulted in fewer motor burnouts and more reliable electricity supply to the farmers.

The community evolved and agreed on the following 'social regulations' and interventions in the village:

- No new bore wells to be drilled in the village
- Equitable access to groundwater to all the families through well sharing
- Increasing the groundwater resources by conservation and recharge
- Efficient use of irrigation water through demand-side management

Conventionally, it is the Groundwater Department that collects and collates the groundwater related information. But this information does not reach the farmers in a simple and useful form. In the existing top-down policy regime, focus is more on imposing a ban on new wells or spacing of wells than empowering communities to evolve their own response to the crisis. In this innovative model promoted by CWS and its partners, the process of generating new knowledge is facilitated by community-led enquiries on various water-related themes such as water levels and their relationship with rainfall; energy consumption and water depth etc. These villages are able to demonstrate that newer practices are feasible to overcome complex problems of ground water governance. The village leadership also provided adequate support to this change process and ensured that deprived communities got access to ground water on a sustained basis. The villagers, NGO staff, CWS shared these experiences with a variety of audiences including policy makers and development practitioners.

While this initiative was ongoing, WASSAN initiated another model for ground water governance. WASSAN negotiated with a group of farmers, who owned bore wells to share ground water with all the farmers (who do not have bore wells) within a designated command area, through pipe network. The main focus was on – *“ensuring protective irrigation to all farmers (bore well owners and farmers who do not have bore wells) in a small patch of command land”*.

The premise is that the protective irrigation to Kharif (the monsoon agricultural season) rain-fed crops on a large area is more profitable to the farmers than assured irrigation to small patch of irrigated Kharif crops. This required considerable efforts to facilitate the farmers groups. Bore well owners agreed to network their bore wells as their own rain-fed plots within the designed command areas would also get protective irrigation (which was not getting any irrigation otherwise) as a result of piped network. Farmers who do not have own bore wells thought that their Kharif rain-fed crops would get protective irrigation during critical periods of crops. They also put a condition to themselves – not to drill any new bore well within the command area.

Several actors provided inputs in this process. A private drip irrigation company provided design support for the pipe line network. An MLA of the region helped in establishing an electrical transformer so that the entire pipe line network and pumps get quality power supply. Mandal Mahila Samakhya (an apex body of women self help groups) channelled funds from AP Drought Adaptation Initiatives project. This project was supported by Commissionerate of Rural Development and World Bank. The agreements between communities were endorsed by Mandal Development Officers and Grama Panchayati members, thus giving sanctity to agreements of local communities. This pilot is being repeated in seven other villages in three districts by WASSAN under various projects. By 2010, the first pilot has already crossed three seasons and all farmers shared ground water.

4.2.3 Lessons from Collaborative Advocacy Efforts by CSOs: Watershed development projects in Andhra Pradesh

4.2.3.1 Background and Relevance of Watershed Development Projects:

Drought-proofing is an important outcome of watershed development projects. Communities in drought-prone areas have been surviving in these areas for ages and they have evolved several systems and practices that help them overcome and/or minimize the negative impacts of such

droughts. Several of these systems/ opportunities are part of the traditional practices and knowledge systems. For example, multiple crops (diversified cropping pattern) helped to ensure food security even in the toughest of droughts. Similarly, livestock rearing was always an important part of livelihoods support systems. The inter dependence of agriculture (particularly rain-fed agriculture) and livestock is internalized in traditional practices & culture of local communities and is part of their knowledge system. With these “culturally entrenched” knowledge systems and practices, droughts and vagaries of climate were not really a serious issue, even in toughest of situations.

The advent of “green revolution” and related package of interventions during the early 1960s, made this traditional knowledge irrelevant. New agricultural practices; dependent on external inputs, were promoted. Farmers, forced to adapt to new systems, were provided incentives in this “transformation” process. The huge infrastructure, established by the government to provide irrigation, fertilisers & pesticides and procurement systems, did have an immediate short term impact on the productivity. Many farmers switched over to those crops, for which there was assured price and procurement by the government. Thus, areas which were not suitable for growing water intense crops (drought prone districts) also slowly shifted to water intense crops and traditional local agriculture was given up. The “new knowledge” of agriculture is applied in all parts of the country (including drought prone areas), without verifying the relevance to local situations. As a result of this, the resilience of local communities disappeared. Impacts of drought are more severe now.

Several CSOs and government supported agriculture research institutions were engaged in finding out solutions to this problem. Many innovative approaches were experimented upon. They demonstrated newer ways of minimizing the impacts of drought. Parallely, Government of India also supported different schemes to address these problems of drought prone areas. After consolidating several lessons from innovative and community based experiments from different parts of the country, Government of India initiated a major program called – “watershed development programs” in 1994. The guidelines of this program gave CSOs the role of Project Implementing Agencies (PIAs). Several CSOs became partners with Governments for the first time, as a result of this policy. In Andhra Pradesh, the trajectory of interventions under this program followed four different phases.

4.2.3.2 Initial Phase – Knowing the Limitations (1994-2000):

Since the scale of watershed development projects was relatively high, Government of Andhra Pradesh established special and dedicated district project offices to steer the projects. Similarly, large numbers of CSOs were identified as partners in implementing the project. During this initial phases, (between 1994 and 2000), the focus was on “engineering” treatment of interventions and emphasis was more on physical interventions such as water harvesting structures; earthen bunds, gully checks. The informed leadership at state level was aware of some of the limitations of this large scale projects in Andhra Pradesh (Please refer box). The knowledge of and/or acceptance of these limitations was limited to higher level of bureaucracy and that too in tacit form. It appeared for them, that all the lessons from earlier experiences from civil society sector were not relevant to mainstream large scale development projects.

4.2.3.3 Second Phase - Expanding the Boundaries (2000-2004):

In the initial phase, typical problems of partnerships between GO and CSOs came up. CSOs needed to negotiate spaces with the government and to advocate concerns on equity and participation in development. A number of CSOs in Andhra Pradesh felt the need for a network based support organization. So in 1999, an organisation called WASSAN (Watershed Support Services and Activities Network) was established with the objective of strengthening participatory processes in large scale development projects in India. WASSAN has been closely associated with the implementation of the watershed programme in Andhra Pradesh since 2000. This section of the case study traces the path traversed by WASSAN and several other actors in ensuring better design and implementation of watershed development projects and its policies.

Initial Limitations
<ul style="list-style-type: none"> • Excessive Emphasis on Engineering works • Limited scope of watershed interventions • Equity, Gender and Participation related concerns were negligible • Low and ad hoc inputs for institution development and capacity building

Providing professional support and advocacy inputs was the main purpose of the organization. WASSAN evolved various strategies for this. The first step was to conduct “Annual Network Meetings” (ANM) where issues related to watershed development projects were discussed. These Annual Network Meetings offered a platform to various stakeholders for sharing their experiences and knowledge on the issues of common interest. Community members, CSO staff, government officers, people’s representatives, media groups, donors and others participated in these meetings every year and WASSAN derived its mandate from these meetings. The themes of some of the ANMs are given in Table 4.2 below.

Table.4 2: Themes of the Annual Network Meetings organised by WASSAN

SI	Themes of WASSAN Annual Network Meetings	Year
1	Concerns for Collective Action in Watershed Projects	2003
2	Enriching Watershed Development. Integrating Emerging Field Experiences	2004
3	A Decade of Watersheds – Consolidating Experiences and Future Search	2005
4	Monitoring for Improving Effectiveness of Public Investments and Role of Civil Society Organizations	2006
5	Self assessment of NRM projects by communities And Strengthening partnerships between GoAP and CSOs	2007
6	Common Guidelines for Watershed Development Program – Roles of CSOs, Capacity Building Strategies and Convergence with NREGA	2008
7	Fair Deal for Rain-Fed Areas – Policies, Practices and Institutions	2009
8	Institutionalizing Partnerships for Innovating Watershed Projects and Employment Guarantee Schemes in India	2010

WASSAN realized the need for generating new knowledge and consolidating existing knowledge from CSOs and also from communities. For better policies and programs, this knowledge base is a critical requirement. WASSAN employed a variety of strategies and instruments to develop this knowledge base- namely forming a technology resource group, conducting writeshops, process studies and pilots. Once these were in place, process guidelines could be drafted and formalised.

Technology Resource Group:

Technology Resource Group, set up in 2001, was an informal group of technologists, scientists and practitioners involved with watershed development program⁴⁷. This group met occasionally and debated on issues with specific reference to technology in the watershed program.

Controlling soil erosion is one of the first steps of watershed development projects. Earthen bunds are the most common intervention for this purpose. However, the construction of earthen bunds along contours or along the boundaries of each plot is a major administrative challenge. Farmers tend to dismantle these earthen bunds (particularly those bunds which are in the middle of their plots and/or the bunds which followed contours of landscape) which are in due course of time making the entire investment redundant. In several locations, the bunds are retained till the payments are made to labourers/ farmers, who constructed the bunds. This practice led to malpractices in the project. Several cases came to the notice of administration

⁴⁷ This group consists of members from various technology institutions such as Central Research Institute for Dryland Agriculture (CRIDA); MANAGE; Agriculture Universities; CSOs that have strong focus on technology; ICRISAT and others.

where the payments are made, but the bunds were never constructed on the ground. When this issue was brought to the notice of implementing agencies, they complained that farmers dismantled them. It was difficult to assess the reality (whether farmers really dismantled the bunds or the accounts were fudged) for the administration. For them the simple option was to ban the earthen bunds. But this ban was a bane to the watershed development projects.

Similarly, GoAP also launched a major scheme for de-silting the tanks and transport the silt to agriculture fields. GoAP supported the cost of digging of silt and farmers are expected to meet the cost of transportation. Influential people (including kin and kin of people's representatives and local leaders) deployed heavy machines got financial support from government. The entire period of excavating tanks and transporting silt was very short, as the heavy machines worked day and night, to maximize their investments. During this short period, many small farmers could not arrange to transport silt, as there was artificial demand for tractors and carts locally and cost was exorbitant to the small & marginal farmers.

WASSAN organized series of meetings with members of Technology Resource Group. Some members of the TRG conducted a series of meetings on the above issues and also field studies to understand the field level realities. The TRG member interacted with government officers and made recommendations on the relevance of such interventions (earthen bunds and other interventions) in watershed development projects and need for expanding the scope of the soil conservation to land husbandry. The TRG recommended a package of interventions is need for soil fertility improvement and soil moisture regime. Earthen bund is the first step in this process, which could not be banned. The main purpose of engineering works/ vegetative treatments is to improve the moisture regime at root zones and soil fertility. A single technical intervention is not adequate to make the difference. The need for integrating local knowledge systems (and variety of indigenous technical practices) and local institutions in the process of technology choice was emphasized in the recommendations of the Technology Resource Group. This was an important element in the process of bringing in the diversity of knowledge systems on technology within watershed development projects. The social and legal dimensions of technology were highlighted in the recommendations of Technology Resource Group in 2004. This interface helped the government to reconsider its position on earthen bunds and brought them back into the watershed development projects.

Writesshops:

WASSAN organized several writeshops in which existing experiences of various organizations and institutions viz. community members, village leaders, CSO staff, government officers, scientists and others were documented in a systematic manner. These writeshops produced compendiums of good experiences and practices on a variety of themes, helping to convert the “tacit” knowledge base into “consolidated” knowledge base. WASSAN further “codified” this knowledge base into various forms – capacity building modules, resource material, policy briefs, case studies etc. These outputs helped to develop deeper insights into various issues related to watershed development projects in the state.

Process Studies:

Both senior government officers and participants of WASSAN Annual Network Meetings could identify issues and concerns related to the gaps between policy (watershed project guidelines) and practices on the ground. Many of these gaps were based on anecdotes and brief visits. There were also disagreements among the members on many of these points. Given this background, Government of Andhra Pradesh (GoAP) requested WASSAN to formally conduct field studies to assess the gaps between policy and practice in the context of watershed development projects in the state. WASSAN conducted a series of process studies to give a better understanding of the field level realities.

In this manner, these studies helped to convert the informal knowledge of the projects in formal research reports. Apart from stating the gaps, the process studies indicated the possible reasons behind the gaps, implications of these gaps and their prevalence. The factors that influenced the adherence to or deviation from a good policy were all listed. These studies formally established the need for enhancing the scope of watershed development projects and better systems of governance.

Pilots and Emergence of New Knowledge:

To improve the quality of on-going projects, GoAP collaborated with Department for International Development India (DFID I, a bilateral donor agency) for implementing AP Rural Livelihoods Project in five districts of Andhra Pradesh (2000-07). The livelihoods project had several options for making the watershed development projects innovative. Though several good development practices were part of knowledge base of the administration teams, there is a sense that these good ideas are not relevant to “our” projects. Given this reluctance of administration to accept knowledge from CSOs; Project Support Unit of APRLP supported large number of innovative pilots within mainstream system under the supervision of existing district

project teams. All these pilots, implemented and guided by CSOs in different parts of the state, helped to generate new knowledge within the mainstream systems in such way that the new knowledge actually “belonged” to the mainstream. This also established the fact that pilots by CSOs within mainstream could be a potential advocacy tool. Though there were several administrative entanglements in these pilots, the experiment had relevance for the key members of mainstream institutions/ departments and helped to “open up” the minds of the mainstream staff to the innovative elements of the Process Guidelines and new policy framework.

Apart from APRLP, independent initiatives by several CSOs/ networks of CSOs experimenting with alternative models/ approaches in watershed development projects were taken up. These alternative models focused on important concerns like food security, gender & equity, dalit empowerment and local and traditional technologies. Rayalaseema Watershed Development Projects (RWDP) and Dalit Watersheds promoted by Deccan Development Society are prominent among these initiatives. (The main differences between the approaches of mainstream watershed and CSO watersheds are given at the end of this theme in Table 3. Apart from this, “WASSAN Action Study Project” (WASP) was initiated to ensure that the spirit of mainstream watershed guidelines is realized at community level and participatory processes get adequate attention.

Process Guidelines:

WASSAN’s engagement with consolidating knowledge and experiences on ground (through writeshops) gave a good understanding on the potential opportunities for improvement. At the same time, the process studies also helped in diagnosing the on-going projects and finding out the causes of various wrong practices. In these two processes, a large number of CSO/ other members were engaged. WASSAN was thus in a position to offer good advice and support to GoAP in the process of improving the policy framework of watershed development projects in the state. GoAP, recognizing this potential requested WASSAN to contribute in the process of developing enabling policy support to watershed development projects in the state. WASSAN then anchored the process of drafting “process guidelines” for watershed development projects in the state in which several network members, government officers and community members actively contributed. This role of WASSAN helped to “mainstream” several good practices from

CSOs into policy of watershed development projects. Government of Andhra Pradesh formally issued Process Guidelines in 2002.⁴⁸

Process Guidelines of watershed development projects helped to enlarge scope of watershed development projects and included several other components – particularly productivity enhancement of agriculture/ livestock; promotion of livelihoods options of poor families. Systems and provisions were made to enhance the support systems for enhanced community participation; capacity building; gender & equity considerations, etc. This phase of the watershed development program demonstrated a rare example where good practices and knowledge generated from alternative sources (mainly CSOs/ Communities) were integrated into mainstream policy of the government in a systematic manner. Necessary funding support was also made available for all these newer components/ elements as part of the program in an explicit manner.

4.2.3.3 Third Phase - Executing the New Process Guidelines (2004-2007):

The execution of new Process Guidelines was a challenge for the government. WASSAN and other members of network closely followed this process of executing process guidelines and offered a variety of support services. Conducting training programs to various categories of actors on the key elements of watershed development projects and its policy framework was one such support. The earlier outputs (from writeshops and process studies) were useful in this process.

Revision of Process Guidelines

Immediately, after the Process Guidelines were issued by the State Government in 2002, a new development threw it out of gear. This was because the Government of India changed the core elements of watershed development projects and its policy in 2003. The new guidelines for watershed development projects called “Hariyali”⁴⁹ did not have adequate space for community participation and no formal space for CSOs in the program. GoAP was not in a position to

⁴⁸ Process Guidelines for Watershed Development Projects in Andhra Pradesh (2002), Commissionerate of Rural Development, Government of Andhra Pradesh.

⁴⁹ Guidelines for Hariyali (2003), Government of India.

implement its Process Guidelines as there was a gap between Hariyali and Process Guidelines. During this time, the entire administration changed and there was a new government at state and central government level. The new administration was keen on resolving the stalemate between Hariyali and Process Guidelines of watershed development projects in the state. To overcome this jeopardy, WASSAN and its network members took the initiative in the process of revising Process Guidelines.

WASSAN annual network meet (ANM) during 2004 set the agenda for this revival of interest on process guidelines. The network meeting clearly mentioned that the district administration is not able to or willing to implement the “process guidelines (2002) even in APRLP districts. There was also confusion whether these process guidelines were applicable to other districts in the state (Non APRLP districts). The role of CSOs in the context of Hariyali was also discussed during this network meet. The ANM broadly recommended re-conceptualizing process guidelines for watershed projects in the light of Hariyali Guidelines.

WASSAN facilitated meetings among selected members from its network on the above issues. The recommendations were shared during the state level conference of project directors, which was organized by Commissionerate of Rural Development. The provisions made in earlier process guidelines (2002) were also discussed during these meetings. During this conference, several ideas and recommendations got crystallized with an active contribution from project directors at district and representatives of CSOs / WASSAN network members. This workshop could be considered as one of the rare events in any collaborative advocacy process, which produced an output (in the form of revised process guidelines, eventually). These conclusions and recommendations were carefully consolidated by WASSAN and CRD representatives. This set of recommendations set the agenda for future action in terms of revision of process guidelines.

An informal working group consisting of members from CRD, AMR APARD and WASSAN was set up to re-conceptualize process guidelines for watershed development projects in the state. The mandate given to this informal working group was to “harmonize” concerns of Hariyali and with experiences/ lessons of APRLP. From this process, two broad outputs emerged.

Process Guidelines for Watershed Development Projects in the State (which harmonized concerns of Hariyali and lessons from APRLP, as per the given mandate) and a capacity building strategy

CRD issued these revised “Process Guidelines for Watershed Development Projects in AP” in 2005, through a special circular. As indicated earlier, the content of the policy is largely derived from the existing good practices (what is practical?) and debates on the project (what is the potential?). Some of the important elements and instruments of process guidelines are briefly mentioned here.

- *Objectives*The process guidelines focussed on improving the productivity of assets of poor and enhancing livelihoods options of poorer communities.
- *Plurality of Institutions:*Unlike Hariyali guidelines, Process Guidelines gave functional roles to various institutions (Grama Panchayat; Village Organization –an apex body of women Self Help Groups (SHGs); SHGs and User Groups) and encouraged functional collaborations among all these institutions. Conservation and development of natural resources was managed by Grama Panchayat and user groups. Village Organization and SHGs were given the responsibility of managing productivity enhancement and enterprise promotion. Fund management norms were clearly defined in the guidelines.
- *Diversified Project Components:* The project components were diversified from conservation and development of natural resources to productivity enhancement and enterprise development. These two additional components exclusively targeted the poor families/ small and marginal farmers. Budgets were provided to all these components and institutional arrangements were defined clearly.
- *Capacity Building Strategy:* Institutional arrangements and delivery systems for capacity building are clearly defined. District/ Cluster Level Livelihoods Resource Centres are established in the state with adequate staff and resources. Role clarity was established for various other functionaries in delivering capacity building services. Collaborative arrangements with CSOs/ Resource Organizations/ Persons were defined as part of capacity building strategy (e.g. Establishing Consortium of Resource Organizations at state level).
- *Empanelment of CSOs:* The process of empanelling eligible CSOs was defined in the process guidelines. Through this process, partnerships between CSO PIAs and Grama Panchayati were expected to be arrived at. However, this provision was not operationalized.

4.2.3.4 Fourth Phase – Revision of Policies, But Struggle for Meaningful Spaces for CSOs (2008 onwards):

During this period, watershed development program faced considerable neglect from the policy makers at central and state governments. The APRLP project was formally closed by Dec 2007. The Parthasarthy Committee submitted its report to MoRD, GoI in 2006.⁵⁰ WASSAN organized/ facilitated series of meetings with this committee and CSOs in the country. It was strongly recommended that community based institutions such as watershed committees should be part of watershed development project and Grama Panchayat should be engaged with governance of projects, rather than implementation of projects. Based on this report, MoRD initiated another process of revising Guidelines for Watershed Development Project under the guidance of Planning Commission, GoI. The process study conducted by WASSAN in seven states of India – “Understanding the Processes in Watershed Development Projects in India (2003-2006) also helped WASSAN to creatively engage with this process of policy change at national level and contribute effectively. As a result of several such efforts, Common Guidelines for Watershed Development Projects (2008) were issued by MoRD.⁵¹ These Common Guidelines are applicable to all watershed development projects funded by MoRD and MoAgri in the country. These Guidelines picked up several lessons from the Process Guidelines of GoAP and almost up-scaled the good elements of watershed guidelines of GoAP. During this period, the importance and priority of watershed development project reduced considerably in the state. Entire administration was preoccupied with implementation of National Rural Employment Guarantee Scheme (NREGA). The watershed projects were neglected in all aspects - deployment of staff; monitoring; fund flows; capacity building support and supervision. This step motherly treatment to watershed development project was questioned by several CSOs and their networks. CSOs from Andhra Pradesh also joined the process of improving policy content of watershed development project in the country. The contribution from CSOs in the process of drafting the Common Guidelines was well recognized by Planning Commission, GoI and MoRD. However, the situation on the ground did not change much. Both central government and state governments were busy in streamlining the administrative set up of watershed development project. Very limited number of new projects was sanctioned by MoRD, GoI during this state. The strengths and weaknesses of this period are briefly mentioned here.

⁵⁰ From Hariyali to Neeranchal: Report of the Technical Committee on Watersheds, MoRD, Govt of India, 2006.

⁵¹ Common Guidelines for Watershed Development Projects (2008), Government of India.

GoAP should have been in a comfortable position to execute watershed development projects as most of its policies (contents of Process Guidelines) were accepted by Gol. But this is not the case. GoAP is deviating from the provisions of Guidelines and digressing from the core principles. The current situation is a cause of concern for the CSOs and agencies that believe in the principles and approaches of participatory watershed development processes. Though there is advancement on the content and conceptual aspects of watershed policies, the ground level action is not matching with this conceptual advancement. WASSAN is engaged with revision of “Process Guidelines” again for the watershed development projects in the state.

4.2.3.6 Challenges and Dilemmas

The challenges are mainly in the following aspects.

Developing and Sustaining Common Platform: Over a period of time, WASSAN ANM became a platform for communication and developing common understanding among various actors. Sharing of new experiences and emerging concerns are an important part of knowledge democracy. Similarly, organizing a dialogue between expert institutions (research and administrative) and practitioners/ CSOs is also an important part of democratization processes, which is performed by the WASSAN ANM. Sustaining this platform is an important requirement for deepening knowledge democracy in water sector. Sustaining interest of key CSO members is an important challenge too. As the policy keeps on defining and redefining the role of CSOs in watershed context, the members engaged in dialogue or discussions or sharing also keep on changing. Developing consistency in debates among all these actors is a major challenge, with these fluctuating policies and roles of CSOs (in the light of changing policies).

Defining the Agenda of Advocacy and Democratic Dimensions: The vulnerable groups (e.g. poor farmers in watershed villages) are often ignorant about the policies and their implications. The advocacy efforts through ANM tried to empower these communities by identifying an agenda that is important for these vulnerable groups. However, the process of identifying the agenda of ANM and advocacy is largely in the hands of selected few of CSO members including WASSAN although sometimes, even government officers (responsible for watershed development projects) contributed to the agenda setting process. Can this proxy representation (of concerns of poor in the process of agenda setting/ advocacy) really strengthen knowledge democracy? – is the question that lingers in the mind. Sometimes, some of the CSOs also think that their concerns are not included in the dialogue process during these advocacy events or WASSAN ANM or writeshops. The process of setting the agenda of dialogue is also process of

exclusion of some section of the society. There is a sense of exclusion among some CSOs as a result of the policy change itself (EG: In Hariyali Guidelines of watershed development projects, several CSOs and CBOs are formally excluded in the policy itself). While negotiating for the space and revised policy, only limited number of agencies (which are capable of functioning as resource organizations) could get space. Large number of smaller NGOs could not find any space in the new policy framework. This sense of “exclusion” led to disowning the networking process and advocacy process by a large number of CSOs. The questions are – “can the advocacy process be sensitive to the needs of all categories of CSO?”

Various Dimensions of Knowledge: There are a variety of interpretations of policy and the argument of most powerful would get accepted. The main purpose of networking and advocacy is to amplify the voice of vulnerable in the process of development. It is difficult to overcome the interpretations of policy by administrators, who are powerful and consider themselves as custodians of welfare of poor. Apparently, most of the decisions taken by administrator are supposed to be in the interests of poor and vulnerable. But the real basis for taking decisions by administrators is very different. Their main concern is – “whether they can monitor the project/ implementation of decisions or not?”. If they cannot monitor, any good decision or idea is not worth implementing. This is the bottom line for decision making in several cases. The real concerns such as relevance of knowledge/ rationale or the benefits to vulnerable groups – come later. This attitude of administrators is a major hindrance in knowledge democracy in watershed sector.

Summary of collaborative advocacy

The experiences of collaborative policy advocacy in watershed development projects in Andhra Pradesh could be considered as successful partnership between state and CSOs in arriving at a policy and proper execution of the same. The process of advocacy benefited from available evidences on ground, good practices and debates on the project. The collaboration between CSO and state had several ups and downs but also showed that effective work together is possible.

In collaborative advocacy process, willingness of state (to change policies) and its role in various stages of advocacy process are important prerequisites. The presence of capable CSOs to join this process is also an important requirement. The partnership between state and CSO in arriving at a mutually-agreeable policy content is influenced by several enabling factors that

helped to make this process work. In retrospect, one could conclude that without such enabling factors/conditions, this process could not have taken place. Interestingly, role of individuals is an important factor that positively influenced the process. The role of CSOs need not stop with getting a policy document in a collaborative advocacy process. CSOs could perform various other functions to ensure that the policy is implemented in its true spirit for achieving the intended benefits.

There are also several concerns and moral dilemmas for CSOs to get engaged in this process such as role clarity, point of view, ability to negotiate with state; autonomy in keeping one's own position. There is limited number of occasions in which CSOs and their networks have "unified" voice. There are also "disappointments" in terms of spaces created for CSOs as a result of advocacy process. Sense of ownership on process and outcome is an important concern, when the results are in expected lines. Similarly, the continuity in efforts and support to this process are an important concern, when the advocacy process is not institutionalized.

The useful lessons and challenges from this experience indicate that both CSOs and state need to operate at certain level of "maturity" to work with each other and appreciate each other's role in the policy formulation processes.

Parameter	Mainstream Watersheds	Dalit Watersheds and Other Equity Centric Watershed Projects
Size of the watershed	500 Ha. Entire village and land belonging to all caste groups. Supposed to be contiguous.	Between 20 Ha to 200 Ha. Land belonging to Dalits. Not necessarily contiguous.
Funding Organizations	Government	International Donors
Main Participants	Entire village. No specific target groups. Rarely poor/ women are in key positions.	Dalits. Representatives of Women groups have occupied key positions.
Facilitating Organizations	Government and Non Government Organizations	Non Government Organizations
Thrust Areas	Drought Proofing. Resource Conservation. Economic Development	Empowerment of poor/ Dalits. Food security. Resource Conservation and productivity enhancement. Economic Development.
Facilitation	Low. Ad hoc.	High. Intense.
Capacity Building Support	Almost absent	Continuous, need based and systematic.
Processes	Low priority. Rigid administrative norms.	High priority. Flexible operating norms.
Institutions	Could not follow guidelines. Weak institutions.	Central to the Programme. Strong institutions.
Technology	Conservation oriented. Rigid norms. Does not allow space for local needs/ practices. Limited options. Ridge to valley.	Production oriented. Flexible. Built on local traditional practices. Site specific. Many options. Scattered/ clusters of plots of Individuals.
Investments	Dispersed/ scattered in the entire watershed. Follows standard schedule of rates. Usually grants from government.	Focused on the individual lands to complete the production cycle. Follows local rates. Some interventions are loan based.
Contribution	No genuine contribution from users. Deducted from wages of laborers.	Genuine contribution from farmers in the form of labor, material and cash. Loans for some components/ treatments.
Impact	Large scale. Wider.	Small scale. Limited to the groups.
Facilitation Costs	Relatively low.	High.

Source: The Watershed Development Program in AP – Reflections for Reforms, M V Rama Chandrudu, (2002)

4.3 Actors, roles and Knowledge Swaraj

4.3.1 Identifying actors

The narratives of the three themes show the presence of a range of actors. The core concerns of Knowledge Swaraj - a Manifesto- (viz. sustainability, plurality and justice) provides a lens with which to view the behaviour of all actors. Firstly though, a suitable grouping of actors was necessary for analysis. The authors used the following grouping of actors into seven distinct categories (Table 4.4) for this analysis.

Table.4 4: Actors grouped in categories

Category of actor	Description
1. Citizens Sector	Farmers (large, small and marginal); institutions and associations of farmers/ other users of water.
2. Political leaders	local leaders from the communities; Sarpanches (Village President), Members of Legislative Assembly
3. Civil Society Organizations	Resource Support Organizations, Field level implementing CSOs, CSO networks and media groups
4. Markets and Commercial Groups	Industrial groups/ developers; Commercial banks including NABARD, Multi/Bilateral Finance organizations such as World Bank and DFID.
5. State Administration	Departments of Rural Development, Irrigation, Renewable Energy, Pollution Control, Electricity; Senior Government Officers at state level, Irrigation Engineers and District and Block Level Officers.
6. Central Government related Institutions	Central Pollution Control Board, Planning Commission, research institutions like Central Research Institute for Dry-land Agriculture and senior government officers at Ministry of Rural Development.
7. Judiciary	District courts, High Courts and Supreme Court

The contribution of each actor towards promoting sustainability, plurality and justice in each theme was analysed as described below.

4.3.2 Sustainability

Interventions of both a social and technical nature were present in all three themes. The sustainability of the water resource itself, benefits of intervention and the sustained engagement of CSOs was explored through some questions listed out.

Key Questions on Sustainability:

- Did the actor ensure that benefits are available for a long period?
- Did the actor help in institutionalizing good practices in the form of policies and programs?
- Did the actor develop his/her own capacities OR support the process of building capacities of others so that the interventions are meaningful and relevant?

It became clear that most actors showed limited or no interest in the sustainability of the interventions. The exceptions are found in the groundwater pilots where actors in the citizens sector and CSOs (i.e. newly formed community institutions there) are ensuring that benefits are sustained and norms are followed. Local political leaders, in agreeing to be members of formal agreements that ensure the governance systems of groundwater sharing, are promoting sustainability. Government Officers, keen on supporting the pilots, challenged the facilitating agencies to make them “administratively meaningful” exercises. However, others in the State Administration, by denying opportunities for up-scaling, make the groundwater pilots isolated and the knowledge thereof unused.

In watersheds the quality of execution of policies is steadily deteriorating. Citizens’ efforts are largely disorganised or dependent on external support systems such as CSOs and Resource Support Organisations. The state administration did not sustain their interest and priority to watershed related issues and constantly shifted to “another important agenda”. Central Govt. institutions showed sporadic and task-oriented involvement and this made their interest in sustainability poor. CSOs however, continue to explore newer opportunities for better implementation of policies. Support from State to this sustained interest of CSOs in watershed policies is fluctuating and there are several ups and downs in the process of engagement.

In river projects on the Tungabhadra, only the marginalised, i.e. project affected people show some interest in sustaining their water resource. The state administration, with its push for new projects and neglect of existing projects, show their lack of concern for sustaining project interventions and the water needed for riverine communities. Political leaders push for new projects and raise concern about improper projects only to gain political mileage. Their short lived interest is thus counterproductive. The Judiciary, when appealed to, makes “legally valid” judgements but these are unjustifiable in terms of limiting water extraction and long term health of the river.

4.3.3 Plurality

Plurality of knowledge systems and thoughts are at the core of democratic functioning. In case of water democracy, the authors asked the following questions, to understand how each actor promoted plurality in water sector, if at all.

- Does the actor respect the point of view/ opinion of others?

- Is the actor open to new ideas and inputs from others?
- Did the actor give space to others and their opinions in decision making?
- Were alternatives in S&T options explored and allowed?

The most successful part of the watershed policy formulation process was the plurality of views incorporated in it. At first, the citizens' sector shared their perspectives, experiences and needs at various forums. This helped in diversifying the package of interventions on watersheds – making water-based livelihood concerns central to the programmes (earlier the programmes had been fixated on physical infrastructure). A large number of CSOs then challenged mainstream thinking by generating new knowledge and experiences (These include incorporating development of assigned lands to *dalit* families; Integrating livestock related issues within productivity enhancement component; going beyond the soil & moisture conservation activities on the principles of land husbandry). The state administration facilitated interactions between CSOs and government officers, conducted pilots that generated newer knowledge and encouraged institutional platforms. The openness exhibited by senior government officers (at state and district levels) was most critical and positive in enhancing the plurality of thoughts and actions in policy formulation processes. National level institutions, recognising the importance and relevance of CSOs created various forums to facilitate interaction between mainstream institutions and CSOs, albeit informally. Central Research Institutions, keen on understanding the alternative experiences of communities and CSOs, joined the advocacy efforts. Also funding agencies strengthened the role of CSOs such that they were able to negotiate with powerful groups including the state administration. There was thus considerable synergy between various categories of actors which resulted in comprehensive watershed policy guidelines for Andhra Pradesh. A common platform established by WASSAN in the form of Annual Network Meetings (ANM) for sharing experiences and evidences of new knowledge from the field (from a variety of actors) helped to strengthen the plurality of thoughts in policy formulation processes.

In the groundwater pilots, some of this synergy was missing. Many, but not all, actors were 'open' to experimenting, facilitating and adopting new knowledge. CSOs held village level communication campaigns that motivated some of the large farmers. These farmers promoted the concept of groundwater sharing and collective management though initially small and marginal farmers were apprehensive. CSOs played a key role as knowledge generators by constantly working on a variety of ideas and generating a wide range of experiences. Some senior government officers at state and district level encouraged this experimentation. Central

level research institutions were willing to experiment with communities and CSOs in application of technology in real-life situation. Commercial companies conducted feasibility studies that helped to develop a clear action plan and technology choice for groundwater distribution. Funding agencies agreed to up-scale these good practices into their projects. However, an important actor from the State Administration, viz. the Irrigation Department, prevented the inclusion of participatory process (which emerged from the experiences of CSOs) and instead strengthened the stereotyped interventions that focus on physical infrastructure.

In the case of Tungabhadra's river projects, the issue of plurality got no attention. The interventions, primarily of a complex technical nature, need to be cleared by various departments of the state administration. Thus they call for at least plurality of knowledge within the state government's departments to be included. The process of decision making and internal consultation being opaque, it is not clear to what extent the experiences of various departments are included. There was no space for knowledge of other actors to be recognised.

4.3.4 Justice

Democratic processes are expected to ensure justice, even in water sector. The team tried to understand the process of ensuring justice in the experiences by asking the following questions.

- Did the actor listen to the voice of marginalized?
- Does the actor help the marginalized in realizing their aspirations?
- Did the actor facilitate the process of accessing benefits by marginalized communities?
- Did the actor stand for inclusive approaches in the process of development?
- Did the actor ensure accountability in case of failures and violations?

The groundwater pilots were most successful on the issue of justice. They ensured that marginalized sections within the village could access groundwater for critical irrigation and drinking water. These pilots questioned the structural differences within society that reinforce injustice and inequitable distribution of resources. CSOs struggled to get space and benefits for the marginalized sections in the villages and negotiated with powerful groups for sharing their groundwater (bore well) with others, who do not have bore wells. They established institutions in which marginalized and powerful could share the decision making opportunities. Local political leaders played an important role in establishing norms and ensured that communities are motivated to follow these norms. The MLA, a higher level political leader, though perhaps not

conscious of the dimensions such as justice and equity, played an important role by recommending the application of groundwater based institutions to the government department. This helped in the establishment of a water sharing mechanism among all farmers within the command area (bore well owners and farmers who do not own a bore well). The role of state administration ended with trying to create support systems for the pilots and they hardly played any role in up-scaling them into other projects/ regions. This reluctance to up-scale good practices resulted into continued injustice to the rain-fed regions and farmers.

Within watershed projects, the marginalised people were rain-fed farmers, livestock rearers, landless families and fishing communities, all in the citizens' sector. Focussing on livelihood opportunities for these communities promoted justice at the level of policy formulation. CSOs played an important role by amplifying the voice of these marginalised sections in policy making platforms. The network approach provided opportunities for various categories of actors to share their concerns and lobby for better policies. All other actors played supportive roles.

On the Tungabhadra's river projects, the record on the count of justice is poor. Citizens' sector, again the marginalised section, got no support from other actors. In violating norms, commercial companies caused injustice. Citizens voiced their concerns against erring departments and private agencies and organized series of protests. They filed cases in the courts of law and also got into direct action, when the authorities did not respond in time. However, the odds against them were heavy.

Political leaders have power and occupy important positions in policy making platforms/ institutions. When convenient for them, they were able to bring the injustice made in Tungabhadra river water management to the limelight and public notice. Media groups publicised their words. But the involvement of both these actors were for political or news mileage and thus short-lived. Justice was not a motivation for them. They did not make any consistent effort to put pressure on the state administration and other powerful groups, in the interest of the poor and marginalized. In fact, when convenient, they pushed for new projects regardless of its implications.

The state administration largely neglected the issues raised by the citizens and allowed the malpractices to continue. Their intension was clearly to hide information. However, administrative steps, necessary to be carried out (in case of complaints), were carried out as per

the legal requirements. There were considerable delays in the process and this was a deliberate strategy. It can only be explained by the assumption that senior officers at state level were particularly supportive to industrial groups/ contractors. They put pressure on the district level officers, who tried to implement the directions of the court of law or/and government policies and eventually transferred them. This experience suggests that higher levels in the state administration are not keen on promoting justice and equity in river management. Inaction was their main strategy for ensuring that powerful actors get more benefits.

Judiciary played a role, albeit with a narrow interpretation of provisions of law. They admitted petitions from the communities, but referred them to river tribunals, arguing that these cases do not fall in their own jurisdiction. It is a well known fact that these tribunals and state administration are not fast and responsive to the needs of deprived communities. The legal entanglements and other conditions make it almost impossible for any community based group/ CSOs to fight for justice in case of river governance.

Comparing themes -examining democratic depth

In all three themes, interventions of both a technical and social nature were present. However the motivations for and manner in which knowledge was created and used, were different in each theme. This in turn influenced the degree of democratisation. Based on the key questions in the first part of the paper, a comparison of the three themes is made in Table 4.5.

Table 4 5: Comparative Analysis of Three Themes/Experiences

<i>Sl. No.</i>	<i>Parameters</i>	<i>River Valley Development -Understanding Tungabhadra</i>	<i>Groundwater Management- Social Regulation</i>	<i>Watershed Projects - Collaborative Advocacy</i>
1	Motive of Intervention	Water extraction/ redistribution	Equitable water distribution Provision of critical irrigation to all farmers in a rain-fed command area	Improving and implementing policy, towards improvement of livelihoods
2	Problem Definition	Economic and political	Socio-economic problem	Socio-economic
3	Dominant Actors	State Admin & Political leaders	CSOs & citizens' sector	State Administration & CSOs
4	Supporting Actors	Central Govt institutions	Panchayats	Panchayats, CBOs
5	Marginalised Actors	Citizens' sector	State administration, landless,	Citizens and Grass-root Level CSOs
6	Nature of intervention	highly technical, long term change in river	Creating technical awareness locally, and promoting efficient use	Policy Change by lobbying and knowledge inputs from CSOs
7	Knowledge creation	Through dept's monitoring, research institutes, preparation of feasibility studies and detailed project reports but these are not presented or accessed easily	Participatory resource monitoring	Through various committees, studies and regular follow-up and monitoring; CSO collaborate with State to share knowledge/ experiences from their field experiences
8	How is knowledge used	Absence of knowledge dissemination; misuse by vested interest is very high; sidelining of departments	Knowledge of groundwater is used to develop community level regulations; cropping patterns and energy use	For policy formulation but not effectively for implementation of policies
9	Setting of norms	State Department sets norms	Community sets norms guided by CSOs	Policy guidelines decide the norms; state level bureaucrats interpret and reinterpret under the influence of CSOs and politicians
10	Implementation of norms	Norms are violated by vested interests as per convenience and Dept. keeps quiet about such violations	Water committees ensures implementation of norms through incentives and penalties	Dept. dilutes norms as per convenience; CSOs provide feedback and meet with different levels of success in different periods of time
11	Expertise needed from CSOs	Transparency and playing watchdog roles; networking expertise; expertise on a long term; expertise of facilitating an interface with a range of stakeholders	Facilitation expertise	Experiential expertise; synthesising experiences; consistency and continuity in efforts

Acknowledgment of limitations by the dominant actors fundamentally determines the degree of democratisation. The dominant actors in watershed projects, viz the State Administration and CSOs acknowledged that the initial engineering emphasis of the project was not leading to the desired objective. Similarly, only when CSOs and the citizen's sector were convinced that

groundwater extraction had to be limited, was the door open for social regulation of groundwater. However in river valleys, acknowledgment that river water extraction must be limited and new projects withheld, is absent among the dominant actors there viz the State Administration and political leaders.

Knowledge is often created by monitoring, but the kind of monitoring varies. While the Groundwater monitoring was participatory, the monitoring in river valleys is by State Departments and research institutes. This is not easily accessible to citizens and CSOs. Knowledge can also be created by committees and specific studies as in watersheds.

There is a tendency to “impose” (project) a particular experience/ approach as more valid and relevant across all the regions, by powerful actors in society. This “dominance” by some actors leads to an “un-democratic” water governance system. Dominant actors do this by derecognising knowledge and expertise (Examples include ignoring a Govt appointed technical committee’s recommendations by political leaders or District level Officers deviating from policy because of difficulty in monitoring interventions).

Decision making (the setting and implementing of norms) strongly affect democratic governance. When communities set norms and compliance is ensured through incentives and penalties ensured by water committees, there is good democratic governance as in the groundwater case. When norms are diluted as per convenience and feedback is not always absorbed, there is less democracy as in watersheds. The watershed advocacy experience also explains the fluctuating levels of success of CSOs in the process of engagement.

In case of river valley theme, the nature of involvement of powerful groups (representatives of people, who are members of ruling parties; administration; industrial groups) constantly challenges democratic processes. This is despite the codification of rules and procedures and necessity of clearances.

Finally, one can see that the “expertise” required from CSOs are different in each theme. The Groundwater case called for facilitation expertise. Synthesising experiences, ensuring consistency and continuity in efforts was the expertise needed in watersheds while the river valley case needs expertise on a long term, interfacing with a range of stakeholders and playing a watchdog role.

4.4. Lessons and Conclusions

The process of democratizing water sector is viewed from the eyes of three experiences on ground – river valley development schemes, collective use of groundwater and network based advocacy for watershed development projects.

The visibility of and respect for the core values of knowledge democracy (sustainability, plurality and justice) in each of these three experiences were different and highly dependent on the behaviour of key players. In two of the themes, CSOs were key players. From these, lessons on the role and contribution of Civil Society Organizations in democratizing knowledge systems in water sector can be drawn.

Democratization of water sector needs some agents/ champions. The bud from which democratisation can flower is an acceptance of limitations in the existing scenario. Such acceptance is at first in tacit form only, so for further democratisation some agents/ champions are needed. When such champions are from the state administration, they can contribute significantly in improving the policy spaces and program designs. But they are not sufficient for establishing sustained democratic processes. It is necessary that the role and contribution from these individual champions are institutionalized systematically. This could be done by constituting advisory/ review committees which have a number of such individual champions. Some members may change over time but others would continue thus providing continuity to the program.

The following lessons for CSOs merit attention.

Problem definition and the solution set: The State defines (water related) problems in a particular way, for which solutions are largely explored in the domain of science, technology and administration. Civil Society Organizations tend to define problems in an alternative way and explore solutions in the domain of local knowledge systems, governance, culture and also demystified science & technology.

Hence, CSOs and the State need to engage in those processes which help in arriving at a more appropriate/inclusive set of solutions for the water sector. This is not easy but complicated and long drawn. There are several disappointments and failures on the way. Success comes, but in bits and pieces - not in a single big chunk.

Expanding boundaries: State and its governance systems broadly define the contours of the “space” (for engagement, discussions, sharing, partnerships, collaboration and policy), in which CSOs could operate. Using this available space effectively and expanding its boundaries depends on a variety of enabling factors, including the capacities of CSOs.

Enabling factors: Consistent support (financial, capacity building support; human resource development, linkages and other forms) to facilitating agencies and communities that deepen democratic processes is one of the critical necessary enabling factors. This support is to be considered as an entitlement of CSOs. Absence of such support could weaken any initiative that promotes democratic processes.

Sharing knowledge is critical for building innovation capacity: Civil Society Organizations need to engage with members of the sector and others in a consistent manner. Sharing of knowledge, experiences and concerns is essential part of democratization. The process of engagement should help in transcending the lessons and knowledge from one context to another (From within the same sector and from other sectors). For facilitating this process, CSOs need to acquire new set of skills, knowledge and attitudes. If the CSOs do not gain this expertise, their outreach would be limited.

Micro -Macro divide: Sometimes Society (particularly state and powerful groups) gives space for CSOs to demonstrate successful models of democratization of water sector at micro level. These micro level successful models help in reinforcing the stereo typed roles of CSOs as “demonstrators of good practices” and/or “innovators at micro level”.

This space is not available for CSOs at macro level to up-scale the lessons from micro level experiences to macro situations. At macro level, the state operates in a closed manner and does not allow well-meaning CSOs to promote knowledge democracy.

Water by its very nature, lends itself to a different scales – from micro-level to macro-level. The groundwater theme deals with micro-level sharing within a village. However, the unit of a single watershed (about 500 ha in extent) can also be considered a micro-level unit. When a large number of similar micro-level units are considered together, a macro-level situation is created. This is the case for the watershed advocacy theme wherein about ten thousand watershed

projects were covered by the Government of Andhra Pradesh, over a period of about ten years. Another kind of macro-level scale is the case of a river. Here the naturally large unit cannot be broken down into *independent* micro units. Any upstream intervention has immediate downstream repercussions. In all cases though, dealing with the State is necessary. Even the micro-level groundwater theme operates in a broader framework of State subsidies for water saving technologies and electricity.

The process of engaging with state is a complex, complicated and long one, even when Civil Society Organizations are networked. The roles and nature of partnerships vacillate under the influence of several factors. Similarly, the process of mainstreaming experiences and knowledge systems from community sector/ Civil Society Organizations sector also takes a long and complicated route and the end results could often be disappointing. Sometimes, when there is synergy, policy formulation that incorporates plurality can be achieved. For Civil Society Organizations, this process of engagement with state and others is a must, as this process is likely to sensitize the key players and is a way of bringing in more balanced approaches in knowledge systems in water sector

The broad understanding that emerges from the above process of reflection & analysis is that - the knowledge systems of Civil Society Organizations and communities/ citizens are rarely used to the fullest capacities and potential in water sector, while commercial and private agencies have a clear, but clandestine influences on knowledge generation processes in water sector. The more powerful actors in water sector thrive on lack of transparency and by mystifying knowledge and technology.

Although this paper seeks to comment on the role of CSOs in Science and Technology in the water sector, the problem of governance colours the issue prominently. The themes/ experiences highlight the role of CSOs in improving the governance and democratic functioning of water sector. Irrespective of the successes and failures on the way, these engagements need to be continued in the larger interests of the society.

5. SOCIALISING SCIENCE IN INDIAN: SOME LESSONS FROM INDIAN EXPERIENCE

The three case studies presented here are indicative of the Indian paradox of excellent science, technology and innovation infrastructure that compares with some of the best in the world and that has led to global leadership in several arenas coupled with poor delivery and fit of this capacity to its citizens. The medical ethics case study reveals this paradox in a stark manner. Unindicated hysterectomy is practiced in rural Andhra Pradesh not too distant from the state capital, Hyderabad that is promoting itself as a global medical tourism centre. In the focus group discussions on climate change in February 2010 that followed the democratizing climate change case study it was evident that even as India had high quality scientific manpower that was contributing to global knowledge on climate science with an Indian, Dr R K Pachauri, at the helm of the Inter Governmental Panel on Climate Change (IPCC), the processes to make use of this knowledge to help local communities make sense of the changes in their own environments was conspicuously missing.⁵²

One of the great challenges in science and innovation policy in India is in establishing the link between knowledge and democracy. Thus another paradox of science policy in India is the claim made in forums such as the World Economic Forum at Davos celebrating India's achievement as the 'world's fastest growing democracy' needs to be seen within the analysis of science policy from a science studies point of view that has revealed science and technology as an elite activity in India with the scientific bureaucracy being historically seen outside of democratic control and questioning. This separation of knowledge creation from democratic aspirations finds mention in the Indian manifesto on science and technology and clearly poses great challenges to socializing science in India.

In this concluding chapter we try to synthesize some learning from the three cases and look at them in combination with some interface exercises where, to use Michael Gibbons's phrase,

⁵² The case study on democratizing climate change and the one on sustainable agriculture focusing on Non Pesticidal Management have not been presented as full fledged case studies in this handbook as they have been linked more actively to the focus group discussion and consultative workshops respectively which have been reflected upon in this chapter.

'society spoke back to science'. As part of the process of piloting *Knowledge Swaraj* two focus group discussions were held at Hyderabad in January 2010 (relating to the medical ethics case) and in February at Bengaluru (relating to the climate change case). In addition there was a consultative workshop that was based on the case study on Non-Pesticidal Management asking a key question "Whose Knowledge counts"? at Hyderabad in March 2010. In each of these well attended meetings, of between 40 – 70 participants representing several scientists as well as members of civil society, policymakers etc. there were interesting opportunities for learning what happens when there is a dialogue on knowledge between different kinds of expertise. Rather than present summaries of each of these cases and the workshops in this section we would like to reflect on the implications for socializing science in India.

From Knowledge Commissions and Innovation Councils to Knowledge Dialogues and Gyan Panchayats

The three cases presented were not only about three different domains but revealed different approaches to looking at science-society relations. The medical ethics case revealed some of the darker side of technoscience that could be separated from ethical or moral concerns. The easy access of a technological tool – in this case relatively simple procedures of hysterectomy – could cause serious problems in health care if they were not accompanied by institutional mechanisms that allowed for scientists to be in regular touch with practices outside their secure hospitals and laboratories. The concerns raised by the doctor couple show what it means to be technologically responsible even as the concept seems to find little mention in the journals of medical ethics that could often focus on animal experiments. The need for scientists to look more closely within and explore *Swaraj* is tellingly raised by the case. Scientists, the case suggests, need to constantly reflect on what it means to be technologically responsible in an increasingly complex world.

How does one bring these issues out? It is here that knowledge dialogues of the kind brought out through the focus group discussions suggest answers. In the medical ethics case National Institute of Nutrition (NIN) was involved in the process of validating the knowledge from the field and had shown willingness to pick up ideas from an informed civil society organization such as Life HRG. The 'opening up' of the conference rooms of this scientific research centre to societal concerns allowed for a different kind of knowledge dialogue that one witnesses not too often in the Indian case. Scientists, drawn from different centres of excellence, were brought together and listened to the young women's stories of unindicated hysterectomy and in the process of

listening they brought their scientific knowledge to the fore to contribute to the situation, offering ways to take this further.

A similar dialogue occurred at the National Institute of Plant Health Management (NIPHM) as part of the consultative workshop in Hyderabad where the Centre for Sustainable Agriculture (CSA) brought scientists from different centres of the Indian agricultural research system to reflect on this rather curious paradox of a successful practice of Non Pesticial Management (NPM) in the state of Andhra Pradesh. A practice of community management of pests had scaled up substantially in five – six years through CSOs such as CSA and a quasi governmental agency meant to promote formation of Self Help Groups (SHGs) to take an active role in rural livelihoods. NPM had reached substantial scale – close to 2 million acres involving over 0.5 million farmers – but surprisingly had not been ‘mainstreamed’ as part of the department of agriculture’s strategy of dealing with pests. The case study and the workshop that followed posed this question of what were the barriers of accepting knowledge from other domains beyond the formally scientific? During the workshop it was apparent that formal spaces for listening to alternate experiences on a level playing knowledge platform seems rare.

The experiences highlighted above thus bring out two aspects.

1. Science and innovation needs knowledge dialogues between different kinds of expertise and
2. There are very few spaces that allow for such dialogues in India today that could reflect on the Indian paradox in S&T that look at issues beyond access of S&T services.

The Indian policy framework has seen recent initiatives on National Knowledge Commission and the more recent National Innovation Council. The three cases suggest that there are clearly issues beyond providing access to S&T services and that there is a need for knowledge dialogues. An ongoing initiative on *Gyan Panchayats* that could be roughly translated as Vilalge Knowledge Bodies indicates some of the possibilities of enabling such knowledge dialogues in the internet era.⁵³

Science Policy as Articulating Swaraj:

⁵³ Refer to the discussions in the site <http://www.vidyaashram.org/> where different forms of the knowledge debates have been explored by a small but vibrant group based in Varanasi that believes that radical intervention in the world of knowledge is a necessary condition for a radical transformation of society.

The Indian manifesto reflected on what would it mean to have Energy Swaraj. The three cases explore this idea of autonomy as important in the knowledge domain. The reconstruction case study talks about the need for Built Environment Swaraj. The climate change case brings to fore the issue of sustainability and urges nations and societies to reflect on climate justice – an issue that found voice during the Copenhagen climate change discussions in December 2009. Science policies in the past have often ignored the concerns of sustainability in the pursuit of short term gains. Policies have been over focused on providing supplies – of energy, agro-chemical inputs, building materials such as cement and RCC without looking at both the issues of alternatives and concerns on sustainability of ecosystems. Rooting sustainability concerns and exploring alternative knowledge systems that often are climate friendly need to be integrated into policy concerns.

This search for alternatives is often resisted as ‘harking back to a hoary past’ and a Luddite response that is anti-scientific. What the case studies suggest is quite the contrary that there is a need for a different kind of scientific literacy that can enable citizens. In the water case study a sustainable management of ground water resources at the village level required simple water budgeting exercises that could be conducted at the village level. The Tungabhadra case, again as part of the water case study, was about citizens equipping themselves to understand scientific data and provide perspectives based on them. *Swaraj* today, as the manifesto argues, requires enabling citizens to engage with science and thus for the scientific elite to take this engagement more seriously. This has important policy implications relating to public understanding of science and scientific communication. The three cases suggest *Swaraj* needs scientific citizenship but this needs to be seen not as a one way street of science speaking to citizens alone but a dynamic process of society engaging with science too.

Socialisation of science needs newer institutions and capacities

The absence of spaces for discussion on science-society issues has been commented on earlier. The discussions with scientists on medical ethics, sustainable agriculture and climate change shows how such facilitated dialogues on knowledge can help bring society closer to science and vice versa. This requires different kinds of capacity building than building scientific infrastructure. It is being increasingly realized that scientists need training in facilitation skills to meet complex challenges. The Institutional Learning And Change (ILAC) initiative of the CGIAR

(Consultative Group on International Agricultural Research) has shown how these skills can help research centres plan better to transform their organisations into learning organisations.⁵⁴

The groundwater social regulation case shows the important role of 'sharing groups' that need to follow the exercise on scientific literacy exercises that involve society working closely based on the scientific information at times of scarcity. The need to build institutional knowledge has been better highlighted in the watershed case study. WASSAN's experiences included creating new spaces such as the 'Technology Resource Groups' to enable science-society interfaces. This was followed up through Annual Network Meetings that mandates organisations to consult and link widely with stakeholders and reflect on changing scenarios. Most scientific institutes in India have annual events but rarely allow for active participation of different stakeholders on a common platform.

WASSAN's experience also shows the role of mechanisms such as 'process studies', the role of pilots and experimentation at the meso level to inform policies and using the very process of formulating guidelines and standards as opportunities for democratising knowledge. Creating these institutions would require a different kind of capacity and social sciences can help in doing so.

Socialisation of science can benefit from CSOs

The manifesto has suggested that civil society has an important role in science and technology in bringing out issues of plurality, justice and sustainability. We have seen how CSOs can enable knowledge dialogues, experiment and articulate alternative knowledge pathways and take a lead in managing complex alliances amongst different kinds of expertise by reinventing institutions. This was evident in all the case studies. This has important policy implications and strengthens the case for more inclusion in decision making and agenda setting of civil society representatives in many of the Boards of scientific bodies. This is all the more pertinent considering the agenda of inclusive innovation and growth in Indian policy circles. Such an agenda we suggest would not be possible without a stronger role for civil society in science.

⁵⁴ ILAC has conducted several facilitation skills workshops for scientists <http://www.cgiar-ilac.org/content/facilitation-training-workshop> and sess this as important capacities for dealing with multiple partners.

This handbook has been unconventional in its approach and has not sought to provide blueprints to policymakers. We argue that it is possibly too early to even think of such a situation in India where there is a need to rework the connection between knowledge and democracy. We have tried demonstrating instead that it is indeed possible to have processes in place that allow for a more serious and active engagement of the scientific community. There needs to be greater public participation in the framing of questions that can allow for the generation of new knowledge. The concerns of climate change and the challenges to meet basic requirements of a large section of India's population still remain. Science and technology have an important role in meeting these challenges. However this cannot happen without greater socialisation of science and without scientists thinking about their technological responsibility. The case studies have amply demonstrated that *Swaraj* or self rule in the knowledge domain is important for looking at science society relations and that civil society can play an important role in making this happen.

We would like to end this summary of lessons learned by providing some glimpses from a recent exercise seeking to review how these case studies have helped these CSOs in highlighting the issues leading to policy change in some cases and in how the manifesto has benefitted them. Details of these are attached in Appendix 1. Below are some excerpts on the sharing of the manifesto ideas.

Excerpts of how the manifesto has been received:

"It has helped relate the issue of science & technology to development of a different kind and provides a base for a critique of various issues facing us today like the proposed Jaitapur nuclear plant and the struggle of the local people against it.

The manifesto has been well-received when discussions come up in our sharing sessions especially issues relating to expertise, - whose expertise? - and the violence of S&T – cultural, as well as physical well-being.

Possibly we need to work out how we can take the value-framework from the manifesto and the case-studies in a deliberate and consistent manner."

Plurality of knowledge does exist but it is limited to a particular area and with people of that location. How the knowledge management is done?

Appendix: Socialising science – Beyond project time frames

A survey was conducted by KICS in March 2011 with the case study leaders requesting them to share details of the processes of sharing the ideas of cases or pilots with broader audience (since April 2010) and of any policy impact that this had. The list is provided below.

Sharing of Medical Ethics case study

1. EMMRC of Osmania University along with Life-HRG is in process of developing an Educational Documentary Movie on un indicated hysterectomy. Major part of shooting in villages is completed.
2. The issue has been shared with the Health secretary of AP through two meetings
3. A member of the state legislative council (MLC) visited the field area and presented the field situation to the Chief Minister.
4. The experiences were shared as part of a sensitization session for students of Science & society program of the Hyderabad University.
5. A lecture was organized on Medical ethics on 14th May 2010 in Ooty in Narayana Gurukulam.
6. A one hour radio talk was organized by AIR ,Ooty on 14th May 2010 on the issue which was later published by *Malayala Manorama* & leading Tamil newspapers on 15th May 2010. A half page length article was published about this issue in one of the leading Telugu news paper. A half hour TV discussion was organized by Etv-2 with Dr Prakash as lead speaker.
7. The issue was presented in Beijing, China on 29th June 2010 in an International conference organized by the Chinese Academy of Sciences.
8. Discussions are underway with the Tata Institute of Social Sciences TISS, Mumbai for a way forward on this issue.
9. Presented a paper on “Case Study on Hysterectomies in AP”---on 18th Nov 2010 in National Bioethics Conference, AIIMS, Delhi. As follow up there was an invitation to write a complete paper in the Indian Journal of Medical Ethics.
10. A half a day session on Un-indicated Hysterectomy in AP, in “International Conference on Impact of diseases & social issues effecting women & their amelioration on 12-14th December 2010-organised by TWOWS India chapter.& Institute of Genetics OU, where 300 women students participated .Principal Secretary Health AP had given opening remarks on this occasion.
11. Sensitized of Principal & Vice principal of Andhra Medical College ,Visakhapatnum about the issue,on 29th December 2010.
12. A lecture on “Role of Millets in Health Promotion on 18th Jan 2011 in DDS
13. A brief presentation on the issue and the way forward was presented at a round table in ‘The way forward in Health Systems’ organized by Institute of Development Studies Kolkata in collaboration with Dept. of Health & Family Welfare, Govt. of West Bengal British Council & DFID on 17 February,2011.
14. At the Angan Wadi workers Education Training Program on 25th Feb in Special Teaching Channel called Mana TV specially for Angan Wadi workers & Mukya sevikas covering 4lakh workers.
15. Part of celebrations of International women’s Day addressed Kishora Balikas, Angawadi workers, Staff of WCW, Students of Govt.Polytechnic College on March 8th 2011 at HariHara Kala Bhavan.

Sharing of the Ecological Farming / NPM case study

- The case study was lead presentation in a National workshop on “Mainstreaming of ecological approaches in agriculture – issues and opportunities” at National Institute of Plant Health Management (NIPHM), Hyderabad, organised by KICS, CSA and NIPHM as part of the SET DEV project in March 2010..
- The case study was the lead presentation in a three day National workshop on Sustainable Agriculture, organised by All India People’s Science Network (AIPSN) at Ananthapur from 1-3rd October 2010.
- Brain Storming session on “ Making IPM Effective in India”, NAAS Complex, organised by National Centre for Integrated Pest Management (NCIPM), New Delhi.
- Through Dr. V Raghunathan, Consultant, FAO, the NPM experiences, scaling up was shared during Project management Committee meeting on Pesticide Regulatory Harmonization among SEA countries during 1-4 June in Bangkok. Dr. Raghunathan was present in the workshop organised as a part of this study.
- Discussion with Education department and Minister for School education of Madhya Pradesh regarding creating a course on sustainable agriculture for school going children.
- With visitors from other countries like Malaysia Agriculture Minister and Director Agricuture, Action Aid staff and Government officials from Afghanistan and with visitors from other states like Orissa and Bihar.
- During *Kisan Swaraj Yatra* with other farmers, organisations and Ministers – lead discussion
- Dr. Arun Balabatti, one of the team member for this case study shared this study and NPM with his colleagues in Karnataka encouraging his staff to look for alternatives.
- Discussed with Karnataka government regarding possibilities of promoting NPM in a meeting to take decision on Banning Endosulfan.

Climate change case study

CED has used the texts and photographs from the case study, for developing lectures and well as preparing presentations. These lectures have been given at Seminars to undergraduate students from different colleges in Mumbai.

The case study has also been published in the KICS, and CED website. Derivatives of this case study are being added to a special module in a climate education sub-website which is a project that is being planned.

Has been shared at

- i. the Bangalore Platform, Bangalore as part of a discussion on linking researchers, analysts and civil society to grassroots action on impacts of climate change.

- ii. INECC Strategic Retreat, Bhubaneswar: as part of the discussions on INECC's reflection on its strategy and processes,
- iii. February Dialogues, Fireflies: The impact of mainstreaming Climate Change in adaptation for Forest Communities and Farmers, focussing on Millets, and other traditional varieties.

Water case study

The case study and process of preparing the same (which is based on internal reflections of anchoring team members) was shared with senior government officers in Government of Andhra Pradesh – Smt Chitra Ramachandran, Principal Secretary (Rural Water Supply and Sanitation Department); Shri Reddy Subramanaym, Principal Secretary (Rural Development), Dr C Suvarna, Special Commissioner (Rural Development). This sharing was informal and in various occasions related to other projects/ engagements with them.

Parts of the case study were shared with Dr Ratna Reddy, Livelihoods and Natural Resource Management Institute and team members at IRC, Netherlands.

Copies of Manifesto and case study document were shared with CINI tem, Jharkhand which is working on knowledge systems on water/ tribal systems in central India.

How the case study has helped you in your own work?

Climate change case study

CED works actively in the INECC process, and this case study has helped us develop a critique of the processes adapted by networks and NGOs in science & technology issues. This has in turned informed CED's information dissemination programmes.

We have been able to sharpen our perspective and programme on:

Climate Education: linking awareness and information dissemination with collaborative action at the graasroots in coastal areas of north Mumbai, and the urban marginalised (slum) in Bengaluru;

Linking and Learning: Bringing researchers and policy analysts to relate with Civil Society on a range of issues – water, energy and agriculture, to develop perspective and programmes that lead to a low-carbon path to development.

NPM or ecological farming case study

- It helped us in introspection of our work.
- Helped in understanding the gaps in technology development, adoption and scaling up

- It helped us in arguing the case more confidently with the scientists and also pointing out the lacuna of existing scientific mechanism in understanding or measuring the efficacy of the approach.

Medical ethics case

The document helped us to show case our work and reflected our approach towards health. It had become an instrument for initiating a dialogue and furthering our work.

Reconstruction and SBE case

“When one is involved in a project, one is in the inside and does not have the time, energy and space to examine and appreciate the emerging connections and implications. A case study like this formally gave me the time and space to not only integrate my own learnings in the 4-5 years of reconstruction work, but also gave the impetus to raise new questions – that of socialization of the science of construction and its alternatives.”

Water case study

This case study was based on the reflections of the anchoring team members. The process of reflections was very intense and tiring. There were several debates on the experiences, lessons learned and meaning of each statement. Sometimes, the lessons learned were not very “new” or “different”. Macro level politics of power seem to be common in all case studies, while the micro level experiences are different. I realized that deeper and honest reflections on our own work are essential from time to time, to consolidate our thoughts. The process also helped to develop theory out of practice (to some extent).

Some policy related information arising out of the process

Climate change case study

The ideas in the case study enabled us in INECC to focus our discussions with the Union Minister for Power, and then again the same person as the Union Minister for Environment and Forests, on issues relating to upscaling demonstrative programmes on renewable energy, and some aspects of the National action Plan on Climate Change, esp those relating to energy and water.

Medical ethics case study

1. Key decisions taken by the Special Secretary Woman and Child Welfare Govt.of A.P (see scanned copy that focus on the decisions below).
2. Around 22,000 unindicated surgeries were rejected by the Government of Andhra Pradesh.

Smt. M. Chaya Ratan, I.A.S.,
Special Chief Secretary to Government



Dr. S. V. Kameshwari
Department for Women, Children,
Disabled and Senior Citizens
L-Block, Room No. 210,
A.P. Secretariat, Hyderabad-500022.
☎ : Off : 040-23456852, Fax : 040-23450008
E-mail : chayaratan@ap.gov.in

D.O Letter No.6134/WP.A /2010 Dt. 18.1.2011

Dear

Sub:- Hysterectomies under Aarogyasri Scheme – Reg.
Ref:- 1. D.O Lr.No.36/PSP/2010 dt. 29.03.2010 addressed to the Pri. Secy. to Govt., HM & FW Dept.
and copy marked to CEO Aarogyasri Health Care Trust, Hyderabad.
2. D.O. Lr.No.6134/WP/A1/2010 dt. 30.09.2010
3.Your D.O. Lr.No.1089/AS.II/F 31/2010011 dt. 16.12.2010

Thank you for your D.O letter at reference 3rd cited and also for having deputed officers concerned to discuss the matter. In continuation of the request vide reference 1st cited and in the light of the report sent by you vide reference 3rd I request you to please consider the following:-

1. As was also suggested to your Officers, patients must have access to their medical records through a password if required.
2. The patient should also give his/her feedback on the nature of the treatment and outcome of the treatment and the software facilitating collation of the same institutionwise for review and appropriate corrective steps.
3. The message that "Aarogyasri discourages organ removal and the same only as a last resort after all other attempts have failed," should be a clear message to all the network institutions. Only physiological indicatives should not result in organ removal including hysterectomies etc.
4. As seen from the report sent by you the age appears to be wrongly reported ex., the age of the woman as per voter card is only 32 years, but age mentioned in the surgical record is 40 years. Therefore, age based on verifiable factors need to be captured to ensure there is no manipulation of the ages.
5. In the case of hysterectomy the panel of doctors to be associated in Aarogyasri should have an established reputation of practicing medicine in an ethical manner with highest standards of integrity.
6. Pre and post operative counseling to both the partners (wife and husband) by a medico-social worker in case of Hysterectomy should be made mandatory.
7. Please consider including a reputed NGO, working with women on reproductive health rights in the panel/special committee to be constituted for coming up with specific recommendations.

In this regard I request you to please consider constituting a team of specialists duly including Dr. Kameshwari, Head of the Department, Women Health Unit, Life Health Reinforcement Group (NGO) and a reputed NGO working with women on reproductive health rights to go into the details of the entire matter and to come up with specific recommendations to minimize organ removal to the minimum essential level. This is perhaps warranted in the light of the percentage of hysterectomy ranging from 1.49% to 7.09% in Anantapur alone.

I request an early reply in the matter.

Yours sincerely,
Sd/-
(M.Chaya Ratan)

Sri A.Babu, IAS.,
Chief Executive Officer, Aarogyasri Health Care Trust,
Dr.Y.S.R.Bhavan, Opp.Dr. B.R.Ambedkar Open University,
Road No.46, Jubilee Hills, Hyderabad – 500 033.

Copy to:-

1. Principal Secretary Medical & Health (name cover) – with a similar request.
2. Director, WD & CW,
3. All RDD's } through the Director
4. All P.D's }
5. State Programme Director, A.P. Mahila Samatha Society } for information & necessary action on promoting awareness.

(M.Chaya Ratan)

For G.Os and other information please visit our website : <http://wcdso.ap.nic.in>