

Research

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1 Background - The Research Focus

Since its independence, India has always been central to the debate on economic, human and more recent, environmental development. While theories suggesting that 'economic growth' would solve many a social/societal problems have been promulgated for some time now, our experiences do not reflect so. For India's sustainable development we have to achieve a harmony between economic, social and environmental forces. It is a fact that while the developed world & rich usually rely on natural resources for profits, the poor rely on natural resources for existence. With intense degradation of ecosystems, the poor lose out on the benefits of ecological services like clean drinking water, housing and cooking material, local medicines, local food varieties, etc., thereby increasing the dependency on the government and other agencies for their upliftment. Further, due to poverty and low educational levels, the poor in the urban and semi-urban areas often have to adopt livelihoods such as waste collection and recycling, which are in the unorganized sector and often poorly paying and exploitative. Recent times have seen a renewed interest in the *“understanding the interrelationship between environmental degradation, over exploitation of natural resources, poverty & under-development”*. This interrelationship has been one of the focus of my research.

Our country has a well developed regulatory mechanism as well as enabling schemes (CDM, ISO 14000, etc) for the organized (industrial) sector to address natural resources exploitation, environmental degradation and pollution, resource conservation, waste minimization. However, the efficiency of regulatory agencies and efficacy of environmental impact assessment tools and techniques have been a matter of concern and projects coming under the scrutiny of being inequitable and environmentally degrading are increasing in recent times. From the first 5-year plan which noted the under-utilization of manpower along with need to harness the natural resources; in recent times India (more so its citizens) has undergone a dramatic shift towards aspiring for a sustainable growth. Projects in the developmental sector (excluding the projects listed under the EIA notification) often get under planned or neglected for their environmental impacts due to their high spatial and temporal variabilities. As of date, environmental and social assessments in the development sector projects (such as watershed, agriculture and irrigation, education, health, etc.) are carried out only at the behest of the multilateral funding agencies. Even the long term programmes and missions of the government of India do not incorporate the environmental assessments into their design. Inclusion of environmental considerations in sectoral policy making has also been recognized as among the principles underpinning the National Environmental Policy, 2006. However, the strategies/ mechanisms for incorporating these objectives and principles into the policies, plans, programmes, and projects for economic and social development have not been promulgated. Thus, there are *“inadequate governmental measures to integrate environmental concerns in development processes”* and this has been my second focus area of my research.

India's 73rd Constitution Amendment Act (CAA) in 1992 brought about a realization of country's efforts towards decentralized planning by providing constitutional legitimacy to lo-

cal governance institutions. The 74th CAA mandated the establishment of District Planning Committee (DPC) as the formal body for preparation of the ‘District Development Plan’ by consolidating the plans prepared by the villages and towns in the district. However, the devolution of powers in the states have only been achieved to various degrees in the last 20 plus years. Also, the status of devolution of departments/subjects with funds, functions and functionaries to the Panchayati Raj Institutions (PRIs) for various states/UTs varies to a great extent. The weak capacity of Local Self Governance institutions or the PRIs has been the major hurdle for the efforts to strengthen decentralized planning.

In addition, many of the schemes and programmes of the government are still vertical in planning and funding. The Planning Commission in its efforts to ensure that the Eleventh Plan is based on consolidation of district plans prepared through DPCs, brought out the “Manual for Integrated District Planning” developed by the Planning Commission of India in 2008. The manual focusses on the financial planning and has suggested means and tools for collection of data regarding the status of natural resources, emphasizes the sustainable use of natural resources and also says about the need to identifying environmental concerns at sectoral levels. However, it is unable to provide inputs regarding the planning for sustainable development of the PRIs. Sustainable development and sustainability of implemented projects can happen only when the overall management of resources is done in a way in which there is decentralized authority and includes participation and involvement of local people in decision making, provision of the infrastructure and capacity building support from the central authority, bringing the ‘sense of belonging’ and accountability through a monitoring mechanism. Thus, *“there is a need to institutionalize mechanisms to address planning as per local level needs at all levels of local self government or PRIs to work towards sustainable development of the nation”*. This has been the third focus of my research.

2 The Research Areas

The research areas of my work have linkages and are at the interface of research foci discussed above.

1. Natural Resource Assessments, Management and Planning

Natural resources like lakes and tanks, soils, livestock and agricultural (and plant) biodiversity which provide the basic ecological services and livelihoods to the majority of the people of the country are extremely important. Soil is one of main resource which is being impacted both in terms of quality and pollution. Studies to understand the impact of non-point sources pollution and agricultural practices are being carried out including:

- Mechanism for Local Assessment of Land Degradation: Case of Waterlogging and Salt Affected Lands and Life cycle assessments of crops including rice, sugarcane and cotton
- Environmental and Social Assessment of the brick making industries in the Sangli-Karad region of Maharashtra
- Introduction of Natural Resource Sustainability in Decentralized Planning at Gram Panchayat Level
- Soil reclamation through technical as well as local cropping pattern changes
- Addressing degradation of soils through a participatory effort at the level of PRIs

Field of Work: Sangli-Kolhapur-Karad Region and Parbhani Region of Maharashtra

Salient Features: Involvement with Local Self Government, Use of open source tools for mapping and application of Life Cycle Systems Thinking for agriculture & livestock and livelihood sector

Plant biodiversity which form the basis of our food and local medicine is threatened and along with it the local knowledge. As these natural resources degradation are at the interface with the farmers, rural and poor populations, they are best managed and conserved at the local levels. Some of research carried out include:

- Policy analysis of programmes in the field of AYUSH systems
- Analysis of the Diagnostics Section in the Public Health System of India
- Development of a Analytic Hierarchy Process tool to help the rural entrepreneur in decision making of choice of technology for extraction of bioactive compounds of plant origin
- Biodiversity and Biochemical Prospecting of Drugs of Natural Origin : A Case of *phyllanthus niruri*
- Extraction Technology Developments for Drugs of Natural Origin: A Case of *phyllanthus niruri*

Salient Features: Involvement with Public Health Department of Maharashtra Government, Use of System Dynamics and Analytic Hierarchy Process tools in the Health sector policy and scheme analysis

2. Environmental Assessments and Waste Management

Research in the area of Waste Management has been on-going both in the country and worldwide. However, the state of affairs for waste management in the country is far from reaching its goal. Most of the smaller towns and villages have not been able to implement Municipal Solid Waste Management due to various reasons including not capacity to plan, financial constraints, lack of infrastructure, etc. Also, the peri-urban region near large cities often need to accept the waste of the larger towns and cities. The various challenges faced by the villages and periurban governments was addressed through following studies:

- Municipal Solid Waste Management: Protocol for Smaller Towns, Gram Panchayats and Villages (applied for Shahapur and Manchar in Maharashtra and Jarod, Gujarat)
- Evaluation of Technologies for Solid Waste Treatment (for Kerala)
- Evaluation of e-waste treatment technologies and the role of unskilled and unregistered ventures in the overall e-waste management

With the increase in the population and increased migration, an acute shortage of residential land has resulted in expansion of towns and cities. Industries which were set up on the edge are now at the centre and planners have relocated these with newer city plan to the outskirts. The vacation of industries from the core city has resulted in land conversion to residential areas, malls, multiplexes and hotels. The main question which arises is that, is it a safe practice to build residential areas and public areas on the industrial lands?

- Need for Site Assessments for Land Conversion in Urban and Peri-Urban Areas
- Assessment of Land Conversions in Peri-Urban Areas

Salient Features: Use of two stage Multi criteria Decision making (Analytic Hierarchy Process Simple Average Weighting) tools for Waste Management sector policy and scheme analysis, Involvement with Local Self Government.

Biogas technology has the potential to address the issue of disposal of municipal solid waste, livestock and agriculture waste as well as human waste. However, the National Biogas and Manure Management Programme has been facing challenges in terms of technology, implementation and sustainability of the biogas plants. A study in this area includes:

- Comparison of Biogas Technologies and development of a decision making tool for choosing a technology for the consumer

- Assessment of Various Substrates for Biogas Production

Salient Features: Analytical Hierarchy Process based multi criteria decision making tool. Developing a C/N chart for various waste material to help in arriving at a ideal mix of waste for biogas.

3. Health

India is a home for 1.2 billion people, which makes healthcare a daunting task for the government. The Government has been majorly focusing on Public health since our independence and a detailed analysis of the country's 5-Year Plans for the health sector revealed that the health system functioning has many issues which still needs to be address to achieve better health status. Also, the health services which is the main interface between the health system and its users have different focus on different aspects of services; especially so for the diagnostics subsector which is relatively lesser focused services as compared to treatment services. The study has been to understand the public health sector and more so the diagnostics subsector.

- Analysis of Health Sector at Country Level
- Review of the Public Health System in Karjat Taluka
- Role of Diagnostics in Health Systems

Salient Features: Involvement with Public Health Department of Maharashtra .

4. Water

In order to reach the MDGs goal of reducing by half, the proportion of people without sustainable access to safe drinking water, by 2015, India has been investing in water treatment systems in a big way. Water quantity and quality deterioration has been witnessed in the country. On the other hand, with increasing number of people becoming conscious of the risks of drinking contaminated water, the demand for water purifiers is rapidly rising. The area of research was to assess the impact on water quality and treatment technologies.

- Nitrate Pollution in Warana Basin
- Assessment of Household Level Drinking Water Treatment Technologies
- Laboratory Treatment Studies of Nitrates in Drinking Water

Salient Features: Involvement with Gram Panchayats and Municipal Corporation .

5. Decentralized Planning and Development Plans for Gram Panchayats

Any developmental activity would not be sustainable if the local stakeholders are not involved in the decision making. The process of planned development took momentum in the country post 1992 though there still are many avenues for progressive improvements. This area of research involved understanding of the decentralization process and progress and linking it with development planning. It also included developing of protocols for planning and preparation of plans for various villages

- Developmental Planning in India - An Analysis
- Sectoral analysis of the Development plan for Karjat town
- Introduction of Natural Resource Sustainability in Decentralized Planning Manual for Planning of Gram Panchayat

Salient Features: MOUs with Chikurde GP, Bhilavdi GP, Manchar GP, Parbhani MC of Maharashtra for planning.

3 Future Research Plan

The work carried out till date has been in line with the CTARA's agenda of practice oriented research for the bottom 80% of the population and towards the establishing the profession of "Development Professional". The future work will also be inline with the CTARA's agenda and the research foci discussed earlier. The work carried out till date was addressing to various diverse sectors and was essential for developing a broad understanding of the Rural Systems and their requirements. Environmental governance in the rural and unorganized sector would require a sensitive understanding of the daily requirements from nature while inculcating the social fabric into its fold and also enabling the local self government in development. Sustainable development of a village or a region depends on its ability to plan for its present and future as well as its capacity and capability to tackle natural and man made disasters. Sustainability of developmental projects/ programs /activities involves multiple domains and divergent interests, perspectives and stakeholders within the context of the natural-environmental, social-political, business-economics, and policy-governance arena. This would involve in-depth research in the decentralization processes of the state governments and its percolation of funds, functions, functionaries and frameworks into the local self governments. Linking the policies changes to the ground realities of the PRIs of insufficient technical and technological capabilities. The future research is bring about more linkages to my present work involving various sectors and would be towards developing a new methodology for planning at local self government levels (PRIs) which incorporates natural resources and disaster planning. Next four years would be more focused on strengthening the local self governance through direct field implementation and would include

- Development of planning tools for rural areas in conjunction with the 73rd and 74th Constitutional Act Ammendments
- Integrating environmental and disaster planning in development plans for sustainable development and adaptation
- Inclusions of project management guidelines in implementation of projects and programmes at gram panchayat levels