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FOURTH SECTOR SCIENCE:
NON-GOVERNMENTAL ORGANIZATIONS IN KERALA

Research in less developed countries has generally been viewed as the province of universities and national research institutes, but this no longer adequately describes the contexts in which research is conducted. Increasingly, non-governmental organizations (NGOs) have become an important source of knowledge generation. Using Kerala, India, as a research site, we present a methodology for the identification and study of non-governmental research organizations (NGROs) in the agricultural and environmental sectors, contrast them with state research institutes and universities, and provide examples of the kinds of work done.

In most work on science and technology for development it is assumed that knowledge is generated by universities and research institutes run by national governments. In recent years, however, non-governmental organizations (NGOs) have become increasingly important actors in the development process.ⁱ Often NGOs take an adversarial role vis-a-vis the state--that is, an ideology gap exists between these sectors in terms of the directions and programs for development. NGOs are characterized as "reluctant partners"ⁱⁱ whose role is to disseminate the knowledge generated by state institutions they do not support. However, the question we wish to address in this paper is the extent to which they are involved in research.

In May of 1994, at the request of the Dutch government, we undertook a project of five weeks duration in the State of Kerala in India. Although we were particularly encouraged by the

work of ODI, IIED, and others, at the outset it was not known whether NGOs were simply users or generators of research. That is, to what extent is it possible to speak of non-governmental research organizations (NGROs) as significant partners with national institutes and universities?

We found that in Kerala NGOs play an important role in research and the production of relevant knowledge in the areas of agriculture and environment. Although the context and activities are distinct from that of established research organizations, NGROs must be considered as part of the national research systems of developing countries.

Farrington and Bebbington provide a general typology of contextual dimensions under which NGOs operate.ⁱⁱⁱ Applying their criteria to India we find a moderate to high government policy toward the rural poor (evidenced by the current importance of decentralizing developmental planning and decision-making to local levels in what are called "Panchayat Raj Institutions"), a strong to medium governmental presence in the rural areas, and a favorable policy toward NGOs (as indicated by the selection of an NGO to operate the extension office for the district around the state capitol).

Kerala is one of the twenty-five constituent states of the Indian union. A tropical land some 38,500 km. square in area, it is situated on the south-western tip of the Indian sub-continent with a population of 30 million. The population is made up of 57 percent Hindus, 21.5 percent Christians, 21 percent Muslims, and the remaining 0.5 percent of Buddhist, Jains, and others.^{iv} Kerala is one of the most densely populated regions in the world, with a population density of 2,000 people per square mile. Population growth rate in the state during the 1950s was the highest in India, yet by the 1970s it had dropped to the lowest. What is remarkable is that this reduction was achieved without coercion. Kerala's female to male ratio is 1.02 to 1 as

opposed to the Indian average of 0.93 to 1 and China's 0.94 to 1.^v The literacy rate in the state is over 95 percent, as compared to the Indian average of less than 40 percent. According to the estimates of Franke and Chasin, Kerala ranks number one in fifteen out of twenty-one selected infrastructural and basic services among all Indian states.^{vi} Moreover, it was the first place in the world to put a communist party in power through free elections and the communists have since played an important role in the government since 1957. Besides the intervention of the state government in redistributive development programs, the active participation of NGOs is often credited for the moderate developmental success of Kerala.

Who and Where Are the NGROs?

It is much more difficult to identify and locate NGROs than universities or national institutes. Bibliographic methods are virtually useless in this respect, as we discovered after a comprehensive search of 17 international databases.^{vii} The problem is to identify NGOs, to determine their substantive focus, and finally to assess the extent of their research activities. We developed general lists from various sources prior to arrival in Kerala.^{viii} Still, those groups with a research focus must be identified using sources and informants within the country itself, especially where their activities fall outside the scope of usual definitions. Here we employed informants from state agencies, national associations of NGOs, large NGOs in Kerala--anyone with field experience who could provide an overview of the sectoral landscape in the state.

As we began interviewing we showed informants our preliminary work. Each was asked to review the list for additions and to identify those organizations that were considered to be "most interested in" or "have some involvement in" research. Eventually we created a longer

("contact") list of NGOs as well as a shorter and more focused list of organizations with whom we would conduct interviews. Those organizations finally selected were those indicated through multiple sources as non-governmental organizations with a particular substantive interest (in our case, natural resources and agriculture) as well as a research interest.

Since relations between state and NGOs in many places are often conflictual, it may seem odd to utilize state representatives as informants. But NGOs themselves are often in competition for funds and sometimes have an interest in concealment, omitting relatively important organizations when asked to provide an overview. In Kerala, the Director of the Department of Science, Technology, and Environment, Professor V.K. Damodaran, was formerly President of the largest NGO in the state. Indeed, a member of an environmental NGO felt free to call the project team at his home simply to provide us with a phone number!

In short, a combination of publications and intensive interviews can be used to develop a population of "potential" NGOs. What does not work is the use of conventional bibliographic search methods, in spite of availability and sophistication of these resources in developed countries.

NGROs, Institutes, and Universities

In this section we provide basic descriptive data from a survey of individuals in the three primary research sectors of interest.^{ix} Altogether 101 individuals were surveyed. Fifty seven percent of our respondents were affiliated with national institutes, 31% with universities, and 12% with NGOs. In terms of organizations, these individuals represent 49 organizations in three sectors.^x Seven are NGOs, 22 are national institutes, and 20 are university departments. Several

respondents whose primary affiliation was in the university or state sectors were members of NGOs as well.^{xi}

The NGOs in this sample were small with one notable exception described below. First, what are their qualifications and to what extent are they involved in research activities? As Table 1 shows, all of our NGO respondents had high educational qualifications. Though possessing fewer doctorates than those in research institutes and universities, more than half have Ph.D.'s.

Table 1. Summary Characteristics of Research Personnel by Sector

	NGO	Institute	University
Highest degree Ph.D.	58%	74%	90%
Highest degree Master's	42%	26%	6%
Age	40	43	43
Years with organization	3	13.4	15
Hours worked per week	60	49	53
Hours per week on research	32	34	25
Number of current projects	2.5	4.2	3.2
Professional meetings attended	17	10	8

Our NGO respondents were only slightly younger than their counterparts in other sectors, but they had been at their present organizations a much shorter time (3 years, as contrasted with about 14). They spend more hours working per week than others, confirming our own

impressions about level of commitment to work in this sector. As interviewers, we observed more activity and bustle around these offices and the people we interviewed seemed to be busier in general than those at universities and institutes. NGO respondents were less likely to be married and have fewer children. More important, they spend more weekly hours on research than university professors (who have, of course, teaching responsibilities) and approximately the same as researchers in state institutes. They work on an average of 2.5 projects, slightly fewer than those in other sectors.

Other important indicators of professional activities show why: NGO researchers are more involved in other types of communication. Those in our sample averaged 17 professional meetings in five years, several more than institute researchers and more than twice as many as those in universities. Most of this difference is due to attendance at meetings on the environment and natural resources, since those in all three sectors attended meetings on agricultural issues to the same extent. This is reflected in the amount of time people spend away from their organizations: university and institute researchers spent an average of one month or less while those in NGOs spent an average of nearly two months gone.

Table 2 shows high levels of other types of traditional professional activities in the five years preceding the survey. NGO personnel are about as likely as those in institutes or universities to be members of professional associations and to hold office in them. They are just as likely as professors and twice as likely than those in institutes to have served on the editorial board of a journal. (In fact, they personally subscribe to more journals than either group, possibly because their organizations are less likely to subscribe to the journals themselves.) Researchers in NGOs were more likely to serve as consultants and attend training courses--both

types of behavior that may involve communication with others outside their immediate field. They were just as likely as those in state research institutes (most of which were agricultural) to have been an advisor to extension services. Finally, they were as likely to have been a member of a government committee or advisory group as other researchers.

Table 2. Professional Activities by Sector

	NGO	Institute	University
Membership in professional associations	70%	86%	84%
Held office in professional association	40%	42%	58%
Served on editorial board of journal	40%	21%	42%
Served as consultant	80%	49%	61%
Participation in training courses	80%	68%	61%
Advisor to extension service	60%	65%	36%
Government committee or advisory group	20%	25%	23%

In terms of written productivity, NGO researchers compare favorably with other sectors. Table 3 presents self-reported productivity averages for the past five years. NGO personnel present papers at workshops and conferences, produce reports, write bulletins, and publish articles, if not quite to the same extent as researchers in other sectors. Yet the differences are illuminating. In terms of reports and bulletins--which tend to be disseminated locally--they produce as much or more as those in universities and nearly as much as those in state institutes. In terms of articles in national journals, they are more productive than those in state institutes.

But in terms of articles in foreign journals and papers at international conferences, they are not as active as the other research sectors.

Table 3. Productivity by Sector

	NGO	Institute	University
Papers at national workshops	3.6	5.5	6.6
Papers at international conferences	1.09	1.8	3.0
Reports	3.4	3.9	2.1
Bulletins	1.2	1.3	1.4
Articles in foreign journals	.45	2.4	2.7
Articles in national journals	5	3.4	8.6

What kinds of facilities do researchers in NGO have at their disposal? Table 4 shows that the NGOs in this sample are not dissimilar to state institutes in certain respects. In terms of human resources, those researchers in NGOs have approximately the same number of professionals and technicians. They have fewer students, of course, than faculty in university positions. When we specified the question as the number of people with whom one "works closely" (rather than "supervises"), universities and institutes fare better, probably owing to the smaller size of NGOs. In terms of four basic infrastructural facilities necessary for research, levels of access by NGO researchers are better than or equal to those in universities or institutes. Of course, this does not apply to specialized research instruments and materials.

Table 4. Facilities by Sector

	NGO	Institute	University
# of professionals supervised	1.6	1.9	.9
# of technicians supervised	4.09	4.05	1.1
# of postgraduates supervised	.7	.8	2.8
# of students supervised	3.4	2	10.2
Secretarial assistance	82%	70%	55%
Telephone	100%	96%	94%
Personal computer	55%	70%	45%
Fax	45%	54%	48%

Finally, what are the main sources of influences on the selection of research problems? We asked respondents how much influence various people and groups had, directly or indirectly, on the kinds of problems they worked on, but found very few differences, even in terms of the orientation to clients or users one would expect. NGOs reported no greater influence of clients or users than those in other sectors where the selection of research problems is concerned. They were slightly (but not significantly) less likely to report influences from donors. However, there was one interesting difference: the impact of the director of the organization and the respondent's immediate supervisor was reported to be greater than in other sectors.^{xii} This could be the result of the smaller size of NGOs, but it confirms the view of many that these organizations are often dominated by a single individual, who sets the agenda and has a strong hand in most activities.

NGO Research in Kerala

Six examples of NGOs in Kerala illustrate the kinds of research involvement that characterizes these organizations as well as different relations with the state.

(1) The Kerala Sastra Sahitya Parishad (KSSP) is the largest NGO in Kerala. It began in 1962 as a forum for science writers who wished to popularize science and translate scientific literature from other languages into Malayalam, the language of Kerala. The KSSP has now transformed into a state-wide grass-roots organization that aims to popularize science and technology for bringing about a "social revolution." Essentially, the KSSP works at the "science-society interface." Over the past three decades the KSSP has developed into a mass movement with over 73,000 members distributed over in more than 2,000 units spread across Kerala.^{xiii}

The KSSP is involved in environmental conservation, literacy promotion, healthcare, science curriculum development in education, and several other areas. According to one KSSP document, it has a "love-hate" relationship with the government. It has organized several campaigns to oppose government programs and projects in areas like forestry, environment, education, drug policy, and so on. However, it has also cooperated with the state in the areas of literacy, educational reform, and science education. Although there are several committed Marxists and Communists active in the organization, the accusation that it is a propaganda front of the Communist Party is vigorously denied by the leadership. It was clear in interviews with other scientists and researchers at state institutes, universities, and other NGOs that many maintain formal and informal links with the KSSP as part of their voluntary work in addition to their main professional employment.

The headquarters of the KSSP is located in Trivandrum, with specialized centers focusing on environment, rural technology, and science education located in different parts of the state. Research work is carried out by KSSP volunteers and paid professionals. The Environmental Centre is located in Trichur and the Science Centre in Kozhikkode. One of the main sources of income is through the publication and sale of journals, magazines, and books, some of which have had large sales throughout the state. The KSSP claims that it does not accept money from any source, foreign or domestic, for operational purposes. However, it does receive funds for specific R&D projects. The Integrated Rural Technology Centre (IRTC) is located in a village in Palakkad district. It is the largest research arm of KSSP, set up through funds from state and central governments. Research on sericulture is a major project of the IRTC in addition to developing appropriate energy technologies like smokeless ovens and medical instruments for non-intrusive diagnostics purpose.

(2) The Environmental Resources Research Centre (ERRC) is similar to a traditional research station in some respects, but with aims that are characteristic of NGOs. It's relationship with the state is cooperative, with a non-conventional energy program funded by the Ministry of Non-Conventional Energy of the Government of India and using the resource mapping scheme developed by the Centre for Earth Sciences of the Kerala government. Based in Trivandrum, it has ten resident researchers, including two women. ERRC was started by retired scientists, the director being a former research professor at the Kerala Agricultural University. and is now involved in research in the fields of rural development and agriculture. One project is rooted in the "adoption" of the village of Kottupuram in Aalapuzha district. ERRC seeks to transform the rural economy of Kottupuram, whose main source of income is from coconut trees. However,

the coconut trees in the area have been dying of a rust for which no remedy was in sight and village incomes declined. ERRC's research seeks to promote a shift from coconuts valleys to herbs, such that valuable medicinal plants can be grown commercially.

While investigating the soil conditions for optimal planting, ERRC scientists discovered the problem of increasing salinity of the soil in Kottupuram. They found that inland waters in the region were becoming mixed with sea water because of the failure of sea bunds separating the backwaters of Aalapuzha. Moreover, they developed a comprehensive village mapping scheme through which they could study the details of the natural, human and animal resources of the village. As part of their comprehensive development plan the ERRC is planning to set up non-conventional energy plants and a rural industry to use coconut shells for making ice-cream cups and turning coconut water into soft drinks. In order to conduct the research the ERRC is setting up their laboratory in Kottupuram and then a village centre for agriculture extension work.

(3) The KJP Research Foundation is the research wing of the KJP Foundation, an NGO involved in improving cashew and other commercial crops in Kerala and Tamil Nadu. The director of the Research laboratory is a retired director of extension at the Kerala Agricultural University while the staff consists of young university graduates and retired agricultural scientists. The scientists are working on tissue culture for micro-propagation of cashew trees, development of bio-fertilizers, and other technologies for increasing the productivity of plantation and horticulture crops of Kerala. They research post-harvest technologies, such as the processing and commercialization of cashew apple and cashew juice (often discarded after harvesting the nuts). The Research Foundation is involved in disseminating this knowledge to

farmers through extension and visit and gives training seminars to government scientists as well as publishing research reports.

(4) Mithranikethan is a large development NGO located in a rural village in Thiruvananthapuram district. Its founder, the charismatic Sri Viswanathan, has won numerous national and international awards for his pioneering work in the field of rural technology and agricultural development. Mithranikethan has a staff of 110 and functions as a residential school, but there is a research and training wing with several young and retired scientists. The explicit policy is that linkages with both farmers and the government are vital for effective research. Research projects have been developed on neutralizing excess acid in livestock feed and artificial insemination as well as sericulture. Technologies such as a knapsack sprayer for cashew shell oil and an improved blade for a tapioca slicer have been developed from projects started by researchers in government institutes. Once wary of the government, this NGO maintains a pragmatic relationship that now includes training of state scientists and it has taken over extension functions within the district. Many of the government and university agricultural scientists we interviewed had attended seminars and courses offered by Mithranikethan.

(5) The Centre for Environment and Development (CED) is a new, research-oriented NGO with four full-time and seven part-time researchers. Its founding illustrates the process characterizing many NGOs. The director of CES has been an active member of the KSSP for fifteen years and was involved in the establishing its Integrated Rural Technology Center 1987-1992. As yet without core support but with project funding from the World Wildlife Fund, CED focuses on environmental issues as well as development policy studies such as the resource mapping project discussed above.

(6) The Programme for Community Action (PCO) is characteristic of an action-oriented NGO seeking empowerment and community development. A Trivandrum-based NGO, research is in the service of a specific goal: to improve the living conditions of the large fishworker community of Kerala. The PCO originated with a group of social activists who worked with artisanal fishermen during the 1960s and cherishes its reputation as a radical organization. Volunteers approach the problems faced by the fishworker community by what has been called "movement-oriented research." To this end they collect data on factors relating to all aspects of fisheries in Kerala to provide an empirical basis for understanding the changing economic, social, technological, ecological, and demographical aspects of fisheries.^{xiv}

Past projects have included the documentation of the relations of production existing in the fishing sector through the study of the impact of mechanized fishing boats and trawlers on the viability of traditional human-powered boats in fishing used by artisanal fishermen. In a study funded by the Indian Council of Social Science Research and later used in political negotiations, PCO examined the impact of effluent run off into the ocean from the government-owned titanium factory in Trivandrum on the fishing community living near the run off. An example of a participatory study involved the socio-economic, ecological, and human costs of the erosion of sea reefs along the 500 km coast-line of Kerala. In many places the reefs were built by the fishermen and the social activists. The scientists and activists who later assessed and monitored the reefs were able to learn from the fishermen about the biological, ecological, and socio-economic impact of these structures.

Conclusions

Since we attempted to interview individuals involved in research it is important not to interpret these results as if they were a representative sample of NGO personnel. However, the six cases show the diversity of research activities in nontraditional settings, while comparisons with universities and research institutes lead to the conclusion that at least some non-governmental organizations (NGOs) may be considered non-governmental research organizations (NGROs).

Conventional bibliographic search methods, in spite of their availability and sophistication, cannot be used to identify important NGROs in developing countries. A variety of methods, including published lists and interviews with key informants, must be used to develop a preliminary census of NGOs with research involvements. The NGO researchers in our sample were characteristically young, or retired scientists, with high educational qualifications who were relative newcomers to their organizations. They typically displayed high levels of commitment to their jobs and devoted more hours to research than university faculty (who are also involved in teaching). In some respects they are highly professionalized, attending more meetings than individuals in other sectors, belonging to professional associations, serving on editorial boards, attending training courses, advising extension services.

In addition, NGO personnel write up the results of their research, present papers at workshops and conferences, produce reports, and articles in national journals. However, they are not as likely as those in other research sectors to publish articles in foreign journals or present papers at international conferences. This is one reason that bibliographic searches conducted on international data bases do not reflect their efforts, in addition to the fact that the research tends to be focused on local issues. Though NGOs are typically smaller than other kinds of research organizations, many have professional staff, technicians, and basic infrastructural

facilities but lack the specialized instruments and materials necessary for many kinds of research and often produce "desk studies" or collect social scientific data.

One factor that emerged as importance to the capacity of Keralan NGOs involved in research is the use of retired scientists. Many of these individuals have worked in government research institutes and have strong linkages with their former employers. Since the age of retirement from state employment in Kerala is 55, a pool of highly trained, experienced scientific workers is available at an age when many individuals are by no means ready to retire from research work. Some scientists working for NGOs who retired from key research positions in the universities and research institutes use the laboratory facilities in these institutions through informal arrangements or with the permission of their former colleagues. The best configuration of staff may consist of a combination of these active retirees with recent graduates in a "mentoring" relationship.

Although NGOs have not traditionally been considered part of the research system of developing countries, it is clearly the case that at least some of organizations in this sector are involved in activities of data generation, analysis, and interpretation that would ordinarily be classified as research. The dearth of scholarly studies of these organizations and activities is in part due to the recency of the phenomenon but also to the methods used by students of science and technology--and hence the operational definitions of "research" employed. To understand the structure and operations of such organizations it will be necessary to solicit more active participation of researchers and practitioners in the developing world.

Notes

i. Farrington, John and Anthony Bebbington, Reluctant Partners: Non-Governmental Organizations, The State, and Sustainable Agricultural Development (London: Routledge, 1993).

ii. Ibid. Farrington and Bebbington coined this term in the wake of their impressive empirical studies. However, they do not see NGOs as purely disseminators.

iii. Ibid, pp. 54-5.

iv. Kannan, K.P., et al., Health and Development in Rural Kerala (Trivandrum: Kerala Sastra Sahitya Parishad, 1991).

v. Sen, A.K., "Indian State Cuts Population Without Coercion," The New York Times, 4 January 1994.

vi. Franke, R.W. and Chasin, B.H., Kerala: Development Through Radical Reform (New Delhi, Promilla & Co. Publishers, 1992).

vii. Full methodological details are provided in Wesley Shrum, Research for Sustainable Development: A Study of Scientific Research Capacity in Kenya, India, and Ghana (The Hague, Netherlands, RAWOO, 1995) and W. Shrum and J. Beggs, "Methodology for Studying Research Networks in the Developing World: Generating Information for Science and Technology Policy," Knowledge and Policy, forthcoming, 1996.

viii. Sources included the Ciran/Nuffic list of NGOs subscribing to the Indigenous Knowledge Network, a list of NGOs in Kerala provided by Anil Singh, Executive Secretary of the Voluntary Action Network India in New Delhi, a group of seven provided by our sponsoring organization (RAWOO), environmental NGOs in India from World Wildlife Fund, and an international directory of NGOs. After arriving we obtained the 1989 Directory of Voluntary Associations compiled by the Dept of Science, Technology, and Environment of the State of Kerala. These sources have the advantage of relative availability but they are often very poor guides and are particularly prone to capturing "phantom NGOs."

ix. There is research done by private firms in Kerala, as elsewhere in the developing world. However, the substantive focus here on agriculture and environmental reduces that involvement to a negligible amount. Research on these topics is confined largely to the public and nongovernmental sectors.

x. These totals include only the structured interviews and not the unstructured discussions with NGO personnel in a variety of contexts.

xi. We base the following analysis on percentages and mean scores only.

xii. This is consistent with the fact that NGO respondents were more likely than others to disagree with the statement "I have a lot of freedom to select my own research problems".

xiii. KSSP is the best known and documented NGO in Kerala. See Kerala Sastra Sahitya Parishad (undated), A Peoples Science Movement: Science for Social Revolution (Trivandrum, Kerala: Kerala Sastra Sahitya Parishad); Govindan Parayil, "Science for social revolution': science and culture in Kerala." Impact of science on society, Number 155, pp. 233-240, 1989; Mathew Zachariah and R. Sooryamoorthy, Science For Social Revolution: Achievements and Dilemmas of a Development Movement: The Kerala Sastra Sahitya Parishad (London, Zed Books, 1994).

xiv. J. Kurien and N. Nayak, "Movement-Oriented Research: The experiences of the Programme for Community Action." Mimeo (1993).