SANITATION AND WATER SUPPLY IN BIG TROUT LAKE: PARTICIPATORY RESEARCH FOR DEMOCRATIC TECHNICAL SOLUTIONS

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ABSTRACT/RESUME

The authors outline a very lengthy process of consultation and community development in Big Trout Lake, Ontario, stretching from 1971 through to the spring of 1982. The project at issue - a community sanitary system - provided valuable learning experiences for all concerned, but clearly demonstrated the very different interests of government and community, of southern bureaucrats and northern residents. Participatory research is discussed as a strategy and a tool through this one case study.

Les auteurs décrivent une longue série de pourparlers et de développements communautaires à Big Trout Lake en Ontario, ayant cours pendant la période s'étendant de 1971 au printemps de 1982. Le projet en question - un système sanitaire pour le village - à fourni a tous les participants une expérience formative de grande valeur, révélant les intérêts très différents du gouvernement et de la communauté, des bureaucrates du sud et des résidents du nord. La recherche par participation est considérée comme stratégie et comme outil dans la description de cette controverse.

CONTEXT

Nearly 700 Nishnawbe-speaking indigenous people live on the Big Trout Lake Indian Reserve. Located in Ontario's remote northern region and inaccessible by road or rail, the community depends almost entirely upon small aircraft for the transport of freight in and out of Big Trout Lake. Most of the people in the community are under 21 years of age. Their homes, as well as the commercial buildings, are mostly situated on Post Island, which is joined by a causeway to two small clusters of houses on the mainland. The majority of the 60 white people in the Big Trout Lake area are government employees, working at the school, nursing station, weather station or airstrip, while the rest are employed at two general stores or a local private airline.

Like similar settlements throughout the Canadian north, the traditional economic base of the Nishnawbe - hunting, trapping, fishing and gathering, combined with the practice of communally sharing surplus - has been systematically eroded since the penetration of the region by the Hudson's Bay Company and the churches in the early nineteenth century. Underdevelopment of the north has meant disease, high mortality rates, alcoholism, inflation, dependence on southern consumer goods, and widespread dependence on state transfer payments for the residents of Big Trout Lake.

The constant interaction of the Nishnawbe and Euro-Canadian cultures renders local social relations exceedingly complex. Class conflict in the community derives less from capital accumulation (capital appears at this point relatively evenly distributed) than from position and status. Elders and shamen, for example, occupy privileged positions, while women and youth have few means of official political or economic participation. However, conflict between Big Trout Lake and external dominant forces, particularly agents of the Canadian state, conforms more closely to prevailing notions of class struggle.

Canada is a semi-peripheral capitalist nation entering the 1980's after a sustained period of economic recession. Under a newly elected right-wing government, the state is increasingly attempting to shift the burden of the recession on to the marginalized and working classes of Canada. The arm of the state responsible for the administration of Indian reserves, the Department of Indian Affairs and Northern Development (DIAND), has recently stepped up attempts to transfer all administrative responsibilities to the local Band Councils. Already stretched to the limit administratively, the Bands are being asked to take over in an era of massive cutbacks in the DIAND budget. Moreover, lands such as those in northern Ontario have become more valuable economically. They are rich in energy resources, and the corporate pressure to "develop" these raw materials is increasing. The Indian Bands now find that their homelands are seen as the last frontier to be conquered by monopoly capital.

While it is true that the forces of dominance have increased of late, so too - dialectically - have the forces of resistance. A generation of young, literate, and politically sophisticated Indian leaders have emerged out of the DIAND programmes that spouted only the liberal rhetoric of "native participation". Able to function effectively in both the Nishnawbe and Euro-Canadlan worlds,

it is this kind of leadership which has become the moving force of the Big Trout Lake Band Council. Their political ideology is guided by the goal of native self-determination and an entrenchment of native culture and tradition: they view themselves neither as capitalists nor socialists. More importantly, however, they and their Elders view the land as the primary focus of struggle. Says the Chief of Big Trout Lake, Stanley Sainnawap: "For the native, loss of land will be a total calamity. The land is not an isolated thing in his life. What is a man without land? He is like a man without legs who crawls and cannot get anywhere. Land is the only natural productive good in this society".

ORIGINS OF THE PROJECT

Penetration by southern technology into northern native communities closely followed the penetration of capital. The state, particularly through DIAND, has facilitated the transition to technological dependence by, in effect, opening up markets for the private sector. This is as true for sewers as it is for snowmobiles.

In 1971, a federal report of the Department of Environment (DOE) indicated "that most waste disposal systems in the community of Big Trout Lake were contributing to the pollution of Big Trout Lake, which is the water supply for the settlement". In 1972, an engineering firm from southern Canada completed a study under government auspices which recommended an integrated waste-water collection and treatment system for the weather station, the Hudson's Bay complex, the nursing station, the school, the Anglican Church and the Band Council Hall. The estimated capital costs of the system, which would include a generator, lift stations, and a packaged sewage treatment plant, was $275,000 (1972 figures), plus annual operating costs of $37,000. Through 1975, detailed specifications were prepared. A buoyant construction industry in the south meant that no private firm bid for the project, and as a result, the federal Department of Public Works was charged with the construction of the system.

However, no native homes were to be included on the sewer line. Then (and now), none of the Indian houses have running water or flush toilets. People haul water from the lake or wells, often from long distances, and use pit latrines for excreta disposal. Most white residences were, already in the mid-1970's, fitted with water systems and flush toilets, usually connected to septic tanks.

Furthermore, no documents from the environmental study or the feasibility work, or the specifications of the system, were forthcoming to the Band between 1971 and 1975. In fact, people had strong doubts that the proposed lagoon for the sewer would prevent contamination of the lake. The breaking point came after construction began, during 1976. While digging the pipeline, the Department of Public Works began blasting along some unmarked graves on Post Island. The recently-elected Band Council was appalled. In October that year they stopped the project.

Empowered, under the Indian Act of Canada, to control access to the Reserve, the Band Council passed a strongly-worded resolution which made it

clear that construction of the sewer would only resume after several conditions were met. Among these, the key demands were: that the sewer route should by-pass the cemetery; that peripheral lines should extend to native homes that DIAND provide funds every two years for the Band to hire their own consultants to test the lake; and that copies of all relevant studies, reports, plans and specifications be given to the Band. After a flurry of inter-departmental meetings, DIAND advised that the project had been cancelled for that fiscal year. Relations between the Band and the three federal Departments soured. Local whites resented the fact that they would not get the new system that they had been promised.

After a long stalemate period, and in response to assurance from the DIAND district office that money was available for the Band to hire its own consultants, the Big Trout Lake Band Council, in late 1977, drew up the terms of reference for an environmental assessment of the DIAND sewage system. These terms included: an analysis of the impact of the system on the eco-system of Big Trout Lake; the system's reliability and maintenance expectations; its socio-economic impact on the community; its cost effectiveness, possible modifications to avoid discharge of effluent directly into Big Trout Lake; and recommendations of alternative water supply and sewage treatment systems. Furthermore, it was understood by DIAND and the Band that Environment Canada, the department responsible for servicing non-reserve houses, would contribute funds to the assessment process.

DESCRIPTION OF EVENTS

1. First Moment: June, 1977 - May 1978

The first phase, or moment, was of about a year's duration and involved the process of negotiating the project. The first meeting to discuss the sewage issue took place in June, 1977, between a member of the Big Trout Lake Band Council and a member of the Participatory Research Project (PRP). The latter had previously worked in conjunction with a native political organization's struggle against a pulp and paper multinational in northern Ontario, and this contributed to the possibility of initiating a working relationship.

In the fall of 1977 the Band Council forwarded to PRP the Terms of Reference for the environmental assessment. At the same time, the first international meeting on participatory research was held at Aurora, Ontario. Later, Idrian Resnick of the Economic Development Bureau (EDB) visited Toronto and discussed the Big Trout Lake problem with reference to the EDB's recently completed appropriate technology for grain storage project in Tanzania. Both influences found their way into the PRP's draft proposals to the Band to carry out the assessment.

Criticisms of the first proposal indicated the need for additional technical experience in sanitary engineering and chemical limnology, and consultants were identified who possessed such expertise, plus, a commitment to appropriate technology and to social justice. Arrangements for fees and expenses were based

on need, and all consultants understood from the beginning that they were Band employees. A revised proposal was forwarded by PRP to the Band in April, 1978. Entitled Big *Trout Lake Sewage System Environmental Assessment: A Participatory Research Model*, the proposal listed four objectives:

I. to recommend the most appropriate options for sewage disposal in the clearest and most accurate way possible, in accordance with the terms of reference;
2. to educate Big Trout Lake residents about the environmental and health issues involved in the sewage problem;
3. to increase the awareness of local residents about their existing research and problem-solving skills, and to encourage local people to become resource people for other communities;
4. to encourage the use of participatory research methods in other local development areas, such as education, small businesses, or land-use.

Consistent with the participatory research approach, it was agreed that the community should direct the research, as well as be involved in carrying it out, from formulating the problem to deciding on the course of action. It was also agreed that the research process should be an educational process and of direct benefit to the community.

Under the terms of the proposal, a southern technical team - composed of a sanitary engineer, a technical advisor, a chemical limnologist, an environmental health specialist, and a participatory research specialist (team leader) - would work together with a larger team of Big Trout Lake residents, as the Community Assessment Committee. Data collection, recording, and re-presentation of findings to the community would draw upon participatory research methods and be conducted jointly. Total budget for the project was set at slightly less than $25,000. In May, 1978, the Band council officially accepted the proposal.

As funds were not immediately forthcoming from DIAND or Environment Canada, the Band voted to use $10,000 from its own capital reserves to carry out as much of the first stages of the assessment as possible. From the beginning it was understood that the Band would control project funds and initiate all other fund-raising matters directly with government departments. In all of the negotiations during the first moment, PRP dealt *unilaterally* with the Band Council and communicated with state agents only upon clearance from the Band. Similarly, all minutes and other information produced in this period by the southern team went directly to the Band Council in writing or by telephone. The considerable expense incurred in communications proved to be worthwhile in solidifying the working relationship.

2. Second Moment: May, 1978- December, 1978

This phase of the project may be considered the first research period and was of about seven months duration. In May, 1978, the southern team met to collectively plan an intensive field visit to Big Trout Lake, identifying critical

issues and unanswered questions and dividing the labour. In June, the 5-person team travelled to Big Trout Lake and worked there for one week, accumulating more than 300 person-hours of consultation time. Living with native families, paying room and board, hauling water and helping to prepare meals were later viewed by the consultants as activities extremely important to their experience of the research process. During the visit, the team, under the sponsorship of the Band Council, undertook the following tasks:

- chemical analysis of water sources and existing sewage lagoon at the school;
- assessment of proposed DIAND system from reports and interviews with the Band;
- survey of native and non-native water sources, and practices in water supply and water use;
- survey of excreta disposal systems and practices for native and non-native households;
- unstructured interviews with native families in their homes;
- community dialogues at general meetings and group dialogues with the Band Council,
- collection of documents on water and wastes in Canada's north and in developing countries.

Local residents assisted in the interpretation needed for these activities, as part of the Band's contribution to the project. Results from the data collection were fed back directly to the people for comment during general meetings and over the local FM radio station. In addition to summarized findings announced in Nishnawbe over the air, a radio phone-in show was also organized but met with minimal success.

Upon their return to the south, the southern team individually wrote and collectively edited an extensive, technical account of their findings and recommendations, designed for use by the Band in negotiations with the government. Although the principle of Band members participating in the writing of the report had been advocated in the proposal, it was found not to be practical or possible, given the demands on Council members in their own communities at the time. The findings of the team were summarized in the report, entitled *Users Making Choices,* as follows:

1. The native people of Big Trout Lake have a number of sources for water, the most important of which is the lake itself. The Indian people have expressed deep concern about the pollution of the lake.

   Water supply for the non-native households is treated lakewater or drawn from a borehole and piped in. The native people of the community do not enjoy such facilities. This has serious implications for the health of the Indian people, particularly for their children, and especially during the spring when overland run-off from melting snow brings sediment and faecal matter onto the ice - a primary source of water at that time of year.

2. The area of Big Trout Lake immediately surrounding Post Island shows classic symptoms of cultural eutrophication, that is, reduction in water clarity, nuisance algal growth, hypolimnetic oxygen deficits and increased nutrient levels. Flushing of the bay is hampered by the island-to-mainland causeway. Of a more serious nature is the prevalence of unacceptably high levels of faecal coliform bacteria.
3. The sources of this contamination are a number of the non-native houses which are using septic tanks and chemical toilets. Similarly, a number of native outhouses, particularly those along the shore areas, are also contributing to the pollution of the lake.
4. The proposed DIAND Sewerage system and treatment plant are inappropriate to conditions at Big Trout Lake for the following reasons:
   a) As designed, the system will have major maintenance and repair problems.
   b) The sewerage system has no real chance of being extended to include a significant number of native homes. It is too expensive for Indian people to afford. As well, no Indian houses have piped water supply.
   c) Apart from short term employment, the sewerage system would be of no direct benefit to the native community.
   d) The system as proposed will not service all of the non-native community, part of which is one of the major point sources of contamination.

The report went on to observe that the problems of excreta disposal, water supply and community health must be solved with a comprehensive approach. In order to preserve and improve hygiene, greater quantities of water should be made available in the native households, through rainwater collection, repaired wells, a street tap system and a trucked water delivery system. The report also recommended that the outhouse system, particularly those near the lake, be improved with rubber liners, berming and vents. The report stated that the sewage system should not be installed. "Water delivery and sewage collection by truck is recommended as the long-term affordable solution for both native and non-native buildings to provide: a) total containment, removal and treatment of human wastes; b) protection of the environment; and c) improvements in public health and hygiene."

A draft of this report was taken to Big Trout Lake in August, 1978, and discussed with the Band Council. Here a decision was made to withhold distribution of the report until the government, particularly Environment Canada, released further funds for the assessment.

At the same time, the Band Council had decided to transfer internal responsibility for the assessment to the Big Trout Lake Health Committee. Both bodies, on which there was some cross-membership, further decided that a less-technical, more popularized version of *Users Making Choices* was required, and that such a booklet should be translated into Nishnawbe.

During the remainder of this phase, from October through December, 1978,

while Environment Canada delayed funds, work continued on a number of fronts: *Users Making Choices* was summarized into 10 pages in a question and answer format; initial research into the specifications of a trucked system was begun; contacts were made for pump maintenance training; the production of rubber liners to prevent outhouse overflow was investigated. In parallel, a revised version of Users Making Choices was produced, printed, and kept under tight security.

By December, 1978, the Health Committee had taken several significant decisions. First, they had identified two local translators to translate into Nishnawbe the 10-page report summary, and to be paid honoraria from project funds. Second, they selected two members of the community for training in pump repair - one with extensive mechanical experience and one more as a "trainee" - for training in pump repair methods. Finally, they set a date in February, 1979, for a community wide seminar to evaluate the technical options recommended by the consulting team.

Third Moment: January, 1979 - October, 1979

By January, 1979, the ten-page summary of *Users Making Choices* had been translated by the two local women and printed by *Wawatay News,* a nearby native newspaper. Later, however, a complaint arose that Wawatay had changed the endings to proper Nishnawbe rather than retaining the endings on the syllabics typically used by the residents of Big Trout Lake.

In mid-February, a group of thirteen Big Trout Lake women met with the two local community Health Representatives in a long meeting to evaluate the technical options set out in *Users Making Choices.* The organizer of the meeting summarized the major "decision-point" issues from the report, and there followed a detailed technical discussion by the women on the local applicability of outhouse improvements (plastic liners, attaching the outhouse to the house), mouldering toilets; trucked water delivery; storage tanks; handpump improvements; and rainwater collection. The women generated a host of technical ideas on all the options, many previously unaddressed by the southern consultants. The women proved themselves to be the true experts, developing, for example, ideas for heating the handpumps in the winter to prevent freezing and for restructuring the attic to permit the installation of storage tanks there. To close out the meeting, the women drew floor plans first, of their own existing homes, and then as they would like them to be with water supply and sanitation improvements.

From February 28 through March 1, the Health Committee convened a Community Seminar in Big Trout Lake at which 100 copies of the syllabic summaries of *Users Making Choices* were distributed. About 50 English copies were also made available. The four-pond sewage treatment system was explained and the technology of pumping out lined outhouses was discussed, using slides, by the consultants. The costs of sewage pumpout and the location of the lagoons were identified as critical questions by those in attendance. Further project activities in handpump training and plastic liner installation were collectively

planned at this meeting as well. Additional water samples were also taken at this time in order to make winter/summer comparisons.

By March, and after much red tape, Environment Canada agreed to release the final $10,000 for completion of the assessment process, but only if the consultants contracted directly with the Department of the Environment. After discussions with the Band, it was decided that the consultants would agree to those terms, but would in practice remain the employees and advocates of the Band, with all data and information first going to the Band and only then to the government.

In late March, 1979, the southern team met in Toronto with the government Overviewing Committee which consisted of representatives from DIAND, Environment Canada and the Department of Transport, to discuss, for the first time, *Users Making Choices.* Heavily outnumbered and decidedly outtalked, the consultants were criticized for not thoroughly dealing with potential uses of the extended aeration (sewer) treatment plant. Government personnel, while agreeing with the *Users Making Choices* theme, saw a "community wide" solution in retaining their sewer with some token modifications in the lower-level technologies (pumps and outhouses). Their adherence to the sewer was adamant. While the meeting proved annoying and somewhat demoralizing to the consultants, it also revealed considerable information about the position of each government department. When the meeting closed, a full telephone report was made by the consultants to the Band Council and a new set of tactics emerged for the coming seven months.

The major decision taken by the Band was to delay any government attempt to meet with the Band until all aspects of the argument for trucked water and wastes had been refined and extended. At this point the consultants, through a variety of networks, were able to circumvent the bureaucracy and engage an Environment Canada employee, a nationally recognized specialist in northern trucked systems, to work as a *private* consultant for a few days for the Band. Much of this working relationship was based on a mutual commitment to northern self-determination and to the shared ideology of appropriate technology.

In mid-May, this new addition plus several previous southern team members, met with the Band at a general meeting in Big Trout Lake. Out of the meeting emerged the need to site the lagoon treatment area to be used by the trucked system. Chartering a local bushplane, a group of Band members and consultants flew over an area on the mainland, locating an acceptable site on another watershed. At the same time, a Big Trout Lake resident and a consultant travelled overland by snowmobile to evaluate the location at the ground level. An excellent location was identified and reported to a subsequent general meeting.

Later that month, using project funds, the two local residents selected by the Health Committee travelled to Winnipeg for a short term, two-day course in well development and handpump maintenance. At the same time, the Health Committee and consultants prepared a proposal to DIAND to fund eight new handpumps and the tools and parts for repairing the old ones.

In June, 1979, three Big Trout Lake residents - two male Health Committee members and a woman Elder - plus a southern consultant, travelled to Baker Lake, in Canada's Northwest Territories. The purpose of this factfinding tour was to enable the group to study Baker Lake's community-wide trucked water delivery and sewage pumpout system which services 1,000 local residents. The group was welcomed warmly by leaders in Baker Lake. They conducted interviews, field observations, and reviewed documentation on the water and waste system. More than 100 photos were taken by the Big Trout Lake visitors. After and during activities, the group would usually reflect on their findings and discuss what new information was needed and how to get it.

It was found that essential to the efficient working of the trucked system was an extensive maintenance capacity with sufficient spare parts, as well as an effective administrative operation. Problems with the system were found to be: the freezing of holding tanks because of bad placement; the use of "honey-bags" when the holding tanks broke down, and the inability of the honey bags to decompose; and the freezing of the sewage line from the lift station to the new lagoon (to which trucks can't drive). Photos of the Baker Lake system were put on display in Big Trout Lake upon the return of the fact-finding group, and the strengths and weaknesses of the trucked system discussed.

Later in June, all of the work completed since January, 1979, was compiled in full by the southern team, into an Addendum to Users Making Choices. The Addendum addressed the question of comparative costs, finding a trucked system based on travel to the newly sited lagoon location was equal in cost to a dual sewer/trucked system for the community. The Addendum strongly objected to technical apartheid in Big Trout Lake and argued more forcefully, with more evidence, for a trucked system for the entire community. Newly computed water quality data bolstered the argument further.

The meeting which closed this phase occured in October, 1979, in Toronto. While each government Department averaged three or more representatives at this meeting, the Band was able to field six Council members (a quorum), and four southern consultants were in attendance, thus balancing the scale, at least in terms of numbers. The purpose of the meeting was to review the Addendum, and personnel from Environment Canada kept close rein on the agenda and discussion all morning, with some professional conflict flaring between government and consultants. During the lunch break, the Band Council and consultants held a separate meeting which delayed the reconvening of the whole group. Returning to the table in mid-afternoon, the Chief announced that the Band had made its decision, and he read the following Band Council Resolution (BCR):

> Whereas the Band of Big Trout Lake has discussed and accepted the report Users Making Choices and its 1979 Addendum;
>
> Whereas the community consensus is that no effluent shall reach the catchment area of Big Trout Lake,
>
> Whereas several of the Band's current programs are oriented towards the trucked water delivery and sewage pumpout system, eg. Housing, School;

Whereas new development is planned for the mainland and existing lagoon facilities are inadequate.

The following course of action is recommended:

1) The implementation of a comprehensive community-wide trucked water and sewage system;
2) Resources be set aside for design and adequate costing details;
3) That funds be provided immediately for improving the hand-pump and latrine facilities outlined in the report;
4) The Band reserve the right to select consultants to implement the above,
5) The Band reserves the right to select a lagoon site; and
6) Funds for this project (mentioned under 1, 2 & 3) should be separate from normal capital funds.

The meeting concluded with an agreement by DIAND to initiate an official "project team" that would develop a submission to the federal Treasury Board towards meeting the objectives of the Resolution.

4. Fourth Moment: October, 1979- December, 1980

Since by early 1980 there had as yet been no official government reaction to the Band's October resolution, Big Trout Lake representatives decided to publicize their problem. The February, 1980 issue of Wawatay News carried a major story entitled "Hot Dispute Over Sewage System Continues in Big Trout Lake." The article emphasized the self-determined research process initiated by the Band, the trucked solution, and the recurring bureaucratic blockages to local efforts.

At the same time the Royal Commission on the Northern Environment released in preliminary form a study advocating appropriate technologies for water and sanitation in northern Ontario native communities. Carried out by an environmental group, the study was particularly critical of DIAND's subsidy system which promoted high cost, complex water and waste systems. Considerable support for, and extension of, the conclusions of Users Making Choices were also found in the RCNE report, which was subsequently more widely distributed in the fall of 1980.

Notwithstanding these and previous developments, DIAND's position changed little. In March, 1980 the Regional Director of Local Government briefed the Director-General, Ontario Region on the trucked water and waste recommendation of Users Making Choices, stating that while the trucked system may indeed be the best technical solution, "an adequate substantiation is not included in the report to initiate a Treasury Board submission for project approval." Specifically, he argued, the report had not dealt with all technical alternatives in sufficient detail, particularly those "incorporating some use of the facility constructed already." In addition, the Band's consultants employed water quality standards for the effluent which far exceeded those of the provin-

cial or federal government. Finally, claimed the Director of Local Government in his memorandum, the costs for the truck system shown by the consultants were too general and thus difficult to compare with other alternatives.

Noting that more than one million dollars had already been spent between 1973 and 1978 on the original treatment facility, the memorandum then, surprisingly, indicated that because of the Band's position, the original project had been deleted from the Region's capital plan and a project to accommodate "any alternative disposal system, including a trucked system," had been substituted. The budget allocation was in the order of $50,000.

In April, 1980 - a full six months after the October meeting - Environment Canada finally made its position clear. A detailed technical critique of *Users Making Choices* and the *Addendum* argued, like DIAND, that all the options and their relative economics had not been presented to the "decision-makers" by the Band's consultants. Nearly half of the critique was devoted to refuting the costs of the trucked water and waste systems calculated by one of the Band's consultants who was himself an Environment Canada employee. Environment Canada claimed that the consultants "failed to meet the Terms of Reference." Additional study must be made of all options, their memorandum concluded. An accompanying document listed five technical alternatives for waste disposal in Big Trout Lake, most of which included sewer lines and mechanized treatment, which should be investigated by a new project team.

Meetings in May, 1980 in Big Trout Lake between the local Health Committee and one of the Band's consultants indicated that on the community front the process had also been temporarily halted. Although the Health Committee now had access to additional funds for sanitation improvements, committee members, because of full-time jobs and other voluntary activities in the community, had been rather inactive of late. For reasons unknown to the Band, the Monarch Pump Company would not sell the requested new handpumps. As well, the two local men trained in handpump repair had been assigned by the Band Council to other necessary technical duties. Finally, no action had been taken on the proposed pilot project to test ten improved outhouses with liners, though the commitments to participate previously made by local residents seemed to still stand.

In consultation with the Band Council, the Health Committee reassessed recent developments and decided to pursue a new tactical course. The Big Trout Lake Band would develop its own Treasury Board submission for the trucked system on its own. The Band would bypass Ontario Region and negotiate the submission directly with DIAND headquarters in Ottawa. A decision was made to engage to assist in this task the consulting engineer who had assisted on the truck system costing in 1979 and who by this time had left the employ of Environment Canada.

In July, 1980 in Toronto, Chief Stanley Sainnawap presented directly to the Minister of the Department of Indian Affairs and Northern Development the Band's proposal to develop a demonstration project involving a community-wide trucked water and waste system. Citing the Department's own statistics on the tragic state of Indian living conditions and consequent ill-health, the

proposal argued that such a project would benefit Bands and Tribes throughout Canada. The project would be undertaken jointly with DIAND and the International Development Research Centre. The document to the Minister concluded with the resolution that:

> The Band of Big Trout Lake, through its Chief and Council and appropriate committees, with the technical assistance of the Department of Indian Affairs and Northern Development and the International Development Research Centre, prepare and implement a complete submission, to the Treasury Board of the Cabinet of the Government of Canada, on a community-wide trucked water and waste solution for Big Trout Lake. The submission will set out in detail the short, medium and long term implementation requirements in terms of capital and recurring costs, engineering possibilities and constraints, maintenance and training. The submission will focus on the community-wide solution as a demonstration project jointly undertaken with DIAND and IDRC and will, accordingly, set out dissemination and education procedures for the benefit of bands across Canada. We are prepared to begin work on the submission in September, 1980.

A few days later the Director-General of Ontario Region had received a copy of the Band's proposal and was expressing interest in resolving the issue.

To counteract government stalling tactics, the Band at the same time sent its engineering consultant "in" to the bureaucracy to gather information on DIAND's and Environment Canada's reaction to the proposal. He emerged out of a week of meetings with the recommendation that the Band follow the "normal project" route rather than the demonstration project path. The main disadvantage of the latter was that it involved another agency (IDRC) interposed between DIAND and the community. In the consultant's view, DIAND personnel would not want to lose control or "change the status quo" and a new such funding arrangement could result in even further delays.

The consultant recommended that the Band negotiate for a transfer of the $50,000 over to their control and that the Band itself carry out the next stages of the research, now being termed a "feasibility study" by DIAND as a continuation of Users Making Choices. Sympathizers within DIAND headquarters in Ottawa also pressed the Band to "go the normal project route." The Director General seemed amenable to the transfer of the funds. The Band, therefore, agreed to change its tactical course and return to pursuing the normal project route once more.

By late September, 1980 progress on the transfer of funds appeared imminent. The Director General had visited the Big Trout Lake area, viewing first hand the appalling water and waste conditions and making a verbal commitment to solve the problem. At the same time, the Toronto Globe and Mail carried stories of DIAND's technical inadequacies in maintaining the sewage facilities of the federal schools in northern Ontario native communities. Similar

news stories appeared in mid-October.

Yet October brought no change in the status of the project. The Band decided to once again send in their engineering consultant to stimulate some action on the part of the government. After meeting with departmental officials through late October, the consultant returned with this pessimistic report:

> It appears that the resolution of the sewage issue at Big Trout Lake is further off than ever. I am sure this is even more disappointing and frustrating for the Band Council and the Community, as it is to me. Unless you are prepared to follow the schedule and plans laid out by INA [DIAND], the future course of action is unclear. As the situation is more of a political issue between you and INA, I have no enlightening recommended course of action.

He went on to suggest that perhaps the Band should reconsider their demonstration project proposal.

DIAND staff had themselves regrouped and were now responding with a firmer position than ever. Two new departmental officials, one an engineer and the other a planner, had now entered the negotiations and were imposing with vigour new conditions on the feasibility study. Before the $50,000 would be transferred, the Band Council had to agree (a) to incorporate a comprehensive community planning component into the study, and (b) to engage a large, established engineering firm to conduct the overall study. In the perception of Band representatives, the former requirement would duplicate previous planning research already conducted in Big Trout Lake and would increase the time needed to complete the overall study, thereby delaying yet again any concrete improvements.

The latter requirement would displace the Band's own consultants with a company which was likely to have had little (if any) experience with trucked water and waste systems, unlike the Band's own consultant. Moreover, large engineering firms, in the perception of the Band Council, had never been known for their cultural sensitivity or commitment to native self-determination and maximal local participation, again in contrast to the Band's own consultants. Later, Band Council members learned that DIAND had already held discussions on the feasibility study with at least one engineering firm of this sort.

Nevertheless, the Band's engineering consultant produced detailed, draft "Terms of Reference" for the feasibility study, which integrated the major methodological and political concerns of the Band along with the technical priorities for further research advocated by the government. Approving these Terms of Reference, the Chief and Council subsequently tabled them at a meeting with DIAND in late November, 1980. A month later, the Department responded by telex with its modifications to the Terms of Reference concerning, mainly, the planning component and emphasis on large consulting firms.

5. Fifth Moment: January, 1981 - present

By the end of 1980 the Band had agreed to the planning component with

the provision that they could select their own consulting organization to head the feasibility study. This concession was won. For the past year and a half, the Band Council has been negotiating with the Department to implement the feasibility study, which in even more detail has indicated the viability and appropriateness of the trucked system, in what has become the fifth, and hopefully the final, phase in this long research process.

During this period Band members elected a new chief and several new councillors. However, a number of individuals who had been involved in the environmental assessment process from the beginning remained on staff and have continued to fight for an appropriate solution to the water and sanitation problems of Big Trout Lake. Without this continuity of personnel, who have acted as facilitators of a kind of "organizations memory" in both technical and tactical terms, the work would not have advanced nearly so far. The Band Council, at this point, can see a real possibility of the system being implemented in the near future.

Typically, the state would have defused, delayed and defeated Band efforts over such an extended period of time; access to a continuous supply of human and capital resources over time is what, in fact, enables the state to "outlast" social protest, particularly when this protest comes from already impoverished groups. However, the people of Big Trout Lake have throughout this process, demonstrated tenacity, creativity and political sophistication of a quality which bodes well for the future of the native movement at large. Their struggle continues.

OUTCOMES

As of this writing the concrete results of this project have been rather limited. Although project funds disappeared before a large number of test liners could be produced and installed, a large rubber liner is now being made for the community's new day care centre and will be pumped out by a local, existing pump. And although pump maintenance training led to some minor handpump improvements, no new ones have been installed. But, more critically, there is no community-wide waste and water system in place. After years of collective environmental assessment, women in Big Trout Lake continue to haul water by hand and latrines continue to clog and will overflow this spring. We can point to the creativity and precision of the state's ability to delay a process inimicable to its interest, and we can rightly emphasize that this type of research takes time, yet the bottom line remains that very few concrete improvements are in the ground.

In material terms, however, the project has been relatively successful at a different level. Of the nearly $25,000 in original project funds, at least 25% was distributed directly to community members of Big Trout Lake. A large amount of this includes the travel and expenses of the Baker Lake study tour and Winnipeg pump maintenance training participants. As well, project money was returned to the community in the form of supplies purchased for meals, room and board, and interpretation and translation honoraria, all paid out when

the consultants visited Big Trout Lake.

At the level of more abstract outcomes, it should be recognized that substantial *new knowledge* has been produced by a variety of collectivities associated with the project. With respect to Band members, considerable new knowledge has been produced about specific water and waste technologies appropriate to the community. This knowledge production occurred during meetings of the Band Council, the Health Committee, the women, at general meetings, both exclusive of and in interaction with the southern consultants.

New knowledge was also generated precisely on how the community can control its *own* new knowledge. By controlling access to information generated during the research process, Big Trout Lake prevented the state from, as is usually the case, appropriating information for its own ends. Instructive here is the analysis of knowledge as a commodity from which surplus value may be extracted. By maintaining control over its own information, with the active assistance of its consultants, the Band was itself able to extract surplus value from the knowledge - in tactical terms, usually, and at times in material terms -- and distribute the benefits within the community.

Much of the task in such a research enterprise of controlling information is learning how to control the consultants. Maintaining control over the funds is the primary source of power, and the recruitment and selection of consultants constitutes another important source. The best consultants will be politically predisposed to native self-determination and appropriate technology, as this project demonstrates. It became clear, as well, throughout the process, that the consultants must remain directly accountable to the community and not the state. The Band has also applied this principle to the current phase of the project and is very clear about the tactical advantages of community accountability.

Both Band members and professional consultants stand to benefit by the new knowledge produced on the effectiveness of various participatory research methods. Among such methods employed in the project were: consulting team working democratically with the local committee; community dialogues at public meetings; specialist training for specialist analysis (eg. pump repair); fact finding study tour to another community; visuals (slides, floor plans, syllabic diagrams); community radio. In combination all did contribute to an expansion to broader-based participation in the environmental assessment. Yet some were blocked. For example, the momentum of the women's meeting on Users Making Choices was not maintained or built upon, largely due to local structural limits to women's general political participation. The effectiveness of others, such as the Baker Lake study tour, could have been multiplied many times over with systematic followup. But insufficient time, resources and capital meant that a number of critical areas were neglected, and this was equally true for community and consultants.

Also created was new knowledge about the operation of the consulting team under participatory research circumstances. Most consultants in the 1977-1980 period, for example, clearly were politicized by their experience in Big Trout Lake, coming to support native self-determination more strongly than when they began. In addition, by working more or less collectively as a team, a good

deal of natural, technical cross-fertilization across disciplines occurred.

The issue of use of project data by professionals was also illuminated. Through 1980, the kinds of uses most of the consultants were interested in involved production of papers for publication and conferences, and the production of future project proposals associated with their institutions. Strong, central control of the information in the south was found to be necessary, and was a task which fell to the participatory research specialist on the team. Timing was found to be critical here. The Band must have the opportunity to use, or at least decide on the use of, the information before the professionals do so. The over-riding point here, however, is that project data function to a great extent as pseudo-wages for the professional's participation. If handled carefully and consistently, the use of safe project data can reduce the monetary expenditure otherwise required to engage the professional's services.

THE QUESTION OF DISSEMINATION

At many points in the research process we noted the willingness of the state to appropriate our users-making-choices approach, take the class conflict out of it, and send it out to all northern native settlements. This constitutes dissemination for dominance, and we did our best to prevent it.

Another matter entirely, however, is dissemination under popular control for resistance. The research process we developed at Big Trout Lake is likely to be replicable: 1) under the popular control of indigenous peoples' organizations; 2) under a liberal, or social democratic, capitalist state; 3) in hinterland regions settled by indigenous peoples. Accordingly, the locations for most probable success would be other parts of the Canadian north, Alaska, and Scandinavia. The particular technology aside, the approach might also be usefully applied in Australia and New Zealand.

However, it is questionable whether the process could be applied in the third world. Literacy levels, communication and transportation facilities, levels of technology and capital penetration, fear of reprisals by class opponents - all of these are factors rendering the setting of a third world village incomparable and inhospitable. In general, though, it would be dangerous to attempt to apply the model anywhere without care and caution. The risks are not those of the professional. The risks are the risks of the people.