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***LEGAL ISSUES IN WATER
RESOURCES ALLOCATION
WASTEWATER USE AND
WATER SUPPLY MANAGEMENT***

**REPORT OF THE THIRD CONSULTATION OF THE
FAO/WHO WORKING GROUP ON LEGAL
ASPECTS OF WATER RESOURCES, WATER SUPPLY
AND WASTEWATER MANAGEMENT
(ROME, 14-16 SEPTEMBER 1992)**



**FOOD AND AGRICULTURE ORGANIZATION OF THE
UNITED NATIONS
(Rome, 1993)**

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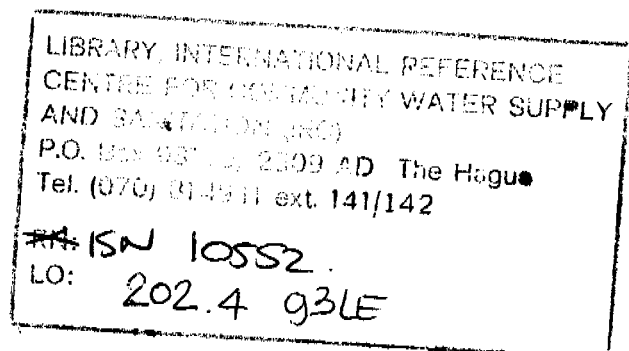
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ABBREVIATIONS

FAO	Food and Agriculture Organization of the United Nations
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
WHO	World Health Organization
WASH	Water and Sanitation for Health Project



INTRODUCTION

I. THE CONSULTATION

Background, objective and conduct of the Consultation

The Third Consultation of the FAO/WHO Working Group on Legal Aspects of Water Resources, Water Supply and Wastewater Management was held at the Headquarters of the Food and Agriculture Organization of the United Nations (FAO) in Rome, from 14 to 16 September 1992. The objective of the consultation was to firm up project ideas aimed at addressing priority legal and institutional issues in the areas of water resources allocation and re-allocation, wastewater use and water supply management.

The Consultation was attended by fourteen persons (the relevant list is given in Annex I), all of whom being old and new members of the Working Group above-mentioned which had formed at the time of the First Consultation (Geneva, 1990). The secretariat to the Consultation was provided by Messrs. S. Burchi, Senior Legal Officer with the host Organization, and L. Laugeri, Institutional Development Specialist with the World Health Organization (WHO). The aggregate membership of the Working Group is also given in Annex I. The Group consists of senior Government sector officials, financial and legal officials from bilateral, multilateral and international support agencies, and sector experts.

Following a welcome address by Mr. G.K. Moore, FAO Legal Counsel, the participants elected Mr. P. Maritz, Deputy Permanent Secretary of Namibia's Water Department, as chairman. Mr. Burchi presented a summary of the two previous Working Group Consultations, and the scope, objectives and organization of the Third Consultation.

Technical presentations were made, in the order, by Dr. D. Caponera on Water Resources Allocation and Re-allocation: selected legal and institutional issues (in Annex II), Mr. S. Burchi on Wastewater use: legal and institutional aspects (in Annex III), Mr. L. Laugeri on Legal Requirements to Improve Community Water Supply Management (in Annex IV) and Prof. H. Shuval on Surveillance and Control of Community Supplies: Legal Aspects (in Annex V).

Brief country presentations were made by Messrs. Maritz of Namibia and Ribadeneiro of Ecuador, while Messrs. Brantly of the Water and Sanitation for Health (WASH) project, Kresse of the German Technical Cooperation Agency (GTZ), and Locke of the Water Supply and Sanitation Collaborative Council presented the views and programmes of their respective organizations.

Results

Based on the projects identified at the Second Working Group Consultation (Geneva, 1991), project ideas were generated in the course of plenary debates (Annex VI). They were the subject of in-depth consideration by two committees of participants (the relevant composition is given in Annex I). Committee One took up the subject of Reallocation of Water Resources, and formulated a project profile on Establishment of an appropriate legal framework for water resources management. This project profile consolidates four separate project profiles on the subject of Reallocation of Water Resources which had emerged from the Second Consultation (Geneva 1991). Committee Two took up the subject of Water supply and wastewater management and produced three project profiles on, respectively, Improving Surveillance of Urban Potable Water Systems, Evaluation of South and Central American Experience with private Participation in Water Systems Management, and Evaluation of Indian Experience with Wastewater Use (project presented by Mr. C.D. Tripathi, Ministry of Urban Development, India). All these projects are reproduced in the next chapter of this Report.

The Working Group Consultation resulted in four project profiles which, while not necessarily replacing the nine project profiles which had emerged from the previous consultation (Geneva, 1991), reflect a number of priority interests of the country officials and of the potential donors and technical assistance agencies represented at the Third Consultation.

Follow-up

The donor institutions present at the consultation indicated specific interest for the implementation of certain project profiles. In particular project No. 3 is due for implementation in the Andean region, while a pilot application of project No. 1 is expected to be carried out in Africa. WHO will forward the other two projects to its regional offices with a view to attracting donor interest for them at the country level. Pilot projects are expected to become operational in 1993 and 1994.

As experience with pilot projects builds up, interest from other countries as prospective recipients of the activities generated by the Working Group, and from other donor institutions, is expected to grow. A Fourth Consultation is expected to be convened in the not too distant future, to disseminate the results of project activities before a larger audience than hitherto, and to generate a new round of projects for short and medium-term implementation.

II. THE PROJECTS

Project Description

1. ESTABLISHMENT OF AN APPROPRIATE LEGAL FRAMEWORK FOR WATER RESOURCES MANAGEMENT

This project write up is to be viewed as a guideline only, to be tailor-adjusted into a project specific proposal by any interested country.

Objectives

To establish an appropriate legislative and administrative framework to identify and compile suitable mechanisms for the sustainable and environmentally sound management (including research, development, allocation, control and monitoring) of water resources (including subsurface water, surface water, above surface water, e.g. mist and clouds, and waste water) as well as for the protection from pollution of those water resources.

Justification

A legislation framework is essential to achieve the objectives as described above.

This framework has to accommodate existing laws and regulations as well as traditional and customary practices, and match these with current trends to declare all water to become either public property or to be controlled by government.

Activities

The project is to encompass the following:

- an inventory and assessment of existing legislation, policies and objectives in the water sector;
- a review of the existing institutional arrangements and administrative procedures for applying current legislation;
- the development of proposals for the updating or revision of the legislative framework, policies, objectives and institutional arrangements (reference may be made to the "Outline for the Preparation of an National Water Resources Law Inventory", FAO Background Paper No. 7);
- the drafting of comprehensive water legislation (inclusive of acts of the legislature and regulations);
- an analysis of the implications of the proposed legislation;

- the facilitation of governmental, professional and public consultations on the acceptability and revision of the proposed legislation;
- the compilation of a final draft water legislation for enactment;
- a final reporting on project experience (to include at least a 12 month post project period).

Outputs, Inputs

The output will be the proposed legislative framework for the water sector together with an administrative framework for implementation, and a documented overview of the processes and results of the project.

Inputs should include expertise in water legislation, water resources planning, water engineering including hydrology and hydrogeology, public health, environmental sciences, sociology and economics. The final composition of the national and international team is subject to the prevailing conditions in each concerned country.

Project Description:

2. IMPROVING SURVEILLANCE OF URBAN POTABLE WATER SYSTEMS

Objectives

In one country, state, or region:

1. Review and improve the legal framework for surveillance of water quality and enforcement of water quality standards.
2. Improve drinking water quality by strengthening the capabilities and legal authority of the agency responsible for conducting water quality surveillance.
3. Create and test a variety of mechanisms for conducting surveillance that are appropriate to urban areas of various sizes.
4. Ensure that information generated by improved surveillance is used to improve the performance of water supply agencies.

Brief description

One principle adopted at the Third Consultation is that a two-tiered system is needed to ensure the quality of potable water. The producer of potable water--the "water supply agency"--is responsible for providing water of acceptable quality and, therefore, for conducting routine monitoring of the quality of water it produces. The governmental agency responsible for regulating water quality--the "surveillance agency," generally a Ministry of Health--is responsible for conducting periodic external audits of water quality to determine whether the water supply agency is fulfilling its responsibilities. This two-tiered system is not being implemented in most developing countries today, either because a single public agency has responsibility for both functions or, where the two-tiered system exists in law, the surveillance agency does not conduct effective surveillance activities.

This project would provide technical assistance for improving the effectiveness of surveillance activities in a developing country that requests such assistance. The project would require two to three years and would concentrate on improving surveillance of water quality in urban areas. The project would involve the following types of activities:

- Review legal instruments (e.g., legislation, executive decrees, regulations) that define the authorities of the surveillance agency and recommend improvements as needed.
- Review the general legal framework for enforcing government regulations through administrative, civil, and criminal actions, and recommend improvements as needed.

- Identify the number and size of cities (systems) to be addressed in the pilot surveillance program, ensuring a range of sizes.
- Improve water supply agencies' awareness and understanding of water quality standards and their responsibility for conducting routine monitoring.
- Strengthen the surveillance agency's technical capacity for conducting surveillance audits, including the availability of laboratory capacity and trained plant and system inspectors. Surveillance may be carried out using a variety of mechanisms (government inspection, contracting for private services, delegation of functions to local NGOs, etc.) appropriate to systems of different sizes.
- Strengthen the capacity of the surveillance agency for using surveillance data to diagnose problems at the water supply agency and assist the water supply agency in correcting such problems.
- Strengthen the capacity of the surveillance agency for enforcing water quality standards, through the development and use of a range of measures for influencing the behaviour of water supply agencies (citations, public notices, fines, peer pressure, liability of managers, etc.).
- Implement measures making water supply agencies responsible for the costs of water quality surveillance activities.
- Evaluate the effect that improved surveillance may have on the ability of water supply agencies to justify increasing tariffs to cover their true costs, and on the willingness of consumers to pay increased tariffs for improved service and water quality.
- Evaluate project results and publish reports in a manner that will promote the use of project results as models for improving surveillance in other countries.

Project Description:

3. EVALUATION OF SOUTH AND CENTRAL AMERICAN EXPERIENCE WITH PRIVATE PARTICIPATION IN WATER SUPPLY MANAGEMENT

Objectives

1. Evaluate experience in the Andean countries, Central America, Chile, and Mexico with various forms of private sector participation in water system management.
2. Conduct the project in a manner that promotes the sharing of experiences among participants from these regions and encourages the discussion of new ideas for increasing and improving private sector participation.
3. Document and publish the results of the study in order to promote dissemination of the lessons learned from this evaluation.

Brief Description

Many cities in Central America, South America, and Mexico have experience with involving private sector firms and non-governmental organizations in the production and delivery of potable water, as well as in the administration and management of potable water systems. Private firms have been contracted to supply services to water supply agencies and water quality surveillance agencies. Private entrepreneurs have made equity investments in systems or system components which they build, operate, and will eventually transfer to government ownership. This project is designed to summarize and evaluate these experiences in a manner that promotes the sharing of experience among participating countries and makes the results available to others.

This project is expected to require approximately six to nine months and would be implemented using two working groups, one addressing experience in Central America and Mexico, the other examining experience in the Andean countries and Chile. Each working group would be composed of professionals (e.g., staff of government agencies, private firms, universities, research institutions, and private consultants) from the countries from which the experiences are to be drawn. Each working group would be assisted by expatriates with expertise in appropriate disciplines, provided by external support agencies. Each working group will include members and advisers with expertise in law, engineering, public health, financial management, institutional development, social sciences, and labour relations.

The evaluation should examine the following issues.

1. What are the legal frameworks under which private organizations have participated in water supply systems? What laws, regulations, and other legal provisions have been necessary to create contractual relations between public or semi-public agencies and private firms/organizations? What legal provisions have been needed to authorize needed oversight and control of private participants? Which legal provisions have facilitated such arrangements, and which provisions have hindered them?

2. What are the institutional prerequisites to success partnerships between public and private organizations in water supply? What capabilities must the public agency have or develop with respect to:
 - the determination of appropriate tariffs for water;
 - the ability to monitor and control the quality of products and services provided by private partners;
 - the management of its finances, including its ability to pay subcontractors regularly and on schedule;
 - the conduct of mid- and long-range planning;
 - the measurement of the performance of its private partners, and the determination of proper remunerations for their products and services;
 - the provision of back-up services to compensate for poor performance by the private partner.
3. In what ways has the status of the public agency responsible for providing potable water changed: as perceived by its managers and staff? as perceived by water consumers? by officials of government agencies with responsibility for water system surveillance? In what ways has the relationship of the public agency with each of these constituencies changed?
4. How have public employees--managers, professional staff, skilled and unskilled labourers--reacted to the involvement of private organizations in water supply, and how have their concerns been addressed and managed? To what extent, and by what mechanisms, have benefits to which such employees were entitled while in the public sector been continued if and when their jobs were eliminated and/or they become employees of private firms?
5. What has been the experience with financial management by private participants in water supply and by public agencies that have involved private partners in their operations? Have private firms with responsibility for conserving and maintaining capital assets done so? Have public agencies been able to fulfil their financial obligations under contracts with private firms? Has there been any improvement in the extent to which the system recovers its full costs? Has there been any change in customers' willingness to pay for water services?
6. What has been the experience with consumer cooperatives and other non-governmental organizations that have taken a role in potable water supply? How have they been organized and how have they performed?
7. Finally, what has been the overall result of private participation with regard to the extent of service and the quality of water provided? Have systems involving private partners increased or decreased the extent of service? Has the quality of water improved or deteriorated? What measures have been needed to deal with issues concerning extent of service and water quality?

Project Description:

4. EVALUATION OF INDIAN EXPERIENCE WITH WASTEWATER USE

Objectives

1. Evaluate the legal, institutional, technological, financial, and social aspects of experience with wastewater use in approximately 12 large Indian cities.
2. Recommend improvements in the legal and institutional framework for wastewater use that will improve its management.
3. Document and disseminate results in a manner that will communicate lessons learned to city administrations in India and elsewhere.

Brief Description

Each of the four largest cities in India (Delhi, Madras, Bombay, and Calcutta) and a number of cities with 1 million or more residents have experience in the treatment and use of wastewater. A systematic evaluation of this experience would be valuable to these cities, to other cities in India interested in wastewater use, and to city governments elsewhere.

The study is expected to require a period of eight months to as much as two years, depending on the type, amount, and form of information available on current Indian experience. The evaluation would be designed and conducted by Indian professional staff and consultants from relevant utilities, government agencies, and research institutions, with the assistance of expatriate consultants. Expertise will be needed in some or all of the following disciplines: law, engineering, public health, financial management, economics, institutional development, and social sciences. Expatriate consultants should have experience with the evaluation of wastewater use programs in locations outside India.

The project should be pursued in two phases: first, the assessment of Indian experience with wastewater use; and second, the preparation of recommendations.

Phase I: Assessment

The assessment should address the following topics:

1. Legal and Institutional Issues
 - What legal requirements exist regarding the performance of the wastewater treatment process, the quality of the treated wastewater, and restrictions on uses of treated wastewater of various qualities, and what has been the actual experience with enforcement and effectiveness of such requirements?

- Do relevant agencies have the legal authority and effective capacity to restrict the use of treated wastewater to appropriate and safe uses (e.g., restrictions with regard to use on certain crops and non-potable urban uses, such as green-space irrigation)?
- What legal authority exists or would be feasible for compelling industrial water users to substitute treated wastewater for their existing sources, and to recycle wastewater within their existing facilities?
- What legal framework exists for creating or compelling agreements for exchanging treated wastewater for higher quality sources of potable water within and among water jurisdictions, and what has been the actual experience with such exchanges?

2. Technology Issues

- How well are existing low-cost and intermediate-technology facilities for wastewater treatment working now, i.e., do or could their treated effluents meet appropriate quality standards?
- What problems have been encountered and solved regarding the use of specific technology by wastewater users?

3. Demand Issues

- Who is now using treated wastewater, for what purposes, in what amounts, and at what cost?
- What are the perceptions and attitudes of current consumers of treated wastewater, and products and services derived therefrom, with regard to the use of treated wastewater in agriculture, industry, and non-potable urban uses (green-space irrigation, toilet-flushing, fire fighting, etc)?
- What are the types of irrigation and crops in current use in agriculture? To what extent would the use of treated wastewater be appropriate in such systems, and to what extent can irrigation systems and cropping be altered to make them more appropriate for using treated wastewater?

4. Financial Issues

- What are the operation and maintenance costs, including capital costs, of existing facilities?
- What is the comparative cost-effectiveness of low-cost (land intensive) and intermediate-technology treatment facilities?
- To what extent have the net total costs of wastewater treatment been reduced by sales of treated wastewater?

- What has been the experience with taxes, service surcharges, impact fees, and other means of collecting payment for wastewater collection and treatment service for urban residents? Have such payments been collected, and have the revenues resulting therefrom been kept and managed by the wastewater authority?

5. Economic Issues

- To what extent could the economic (long-run marginal) cost of potable water be reduced by substituting treated wastewater for higher-quality water in appropriate uses?

6. Monitoring and Quality Control Issues

- What are the existing legal requirements, actual practices, capacity, and results of routine monitoring (by treatment agency) and surveillance (by public health agency) of the quality of wastewater treatment plant effluents?
- What are the existing legal requirements, actual practices, capacity, and results of monitoring for the contamination of agricultural products, the production of which involves use of treated wastewater?
- What are the existing legal requirements and actual experience with controls on industrial effluents discharged to the inflows of treatment facilities, to avoid the introduction of substances that may cause public health problems or reduce the value of treated wastewater to potential users?

7. Other Issues

- What have been (and what are the potential) long-term effects of using treated wastewater in agriculture on soil fertility, groundwater quality, surface water quality, and disease vector control?
- What are the implications of using treated wastewater in agriculture for increasing agricultural production and altering the operational aspects of maintaining regional water balances?

Phase II: Recommendations

The final step in the project is to prepare recommendations regarding the revision of laws, regulations, and institutional frameworks to increase and improve the use of wastewater. This activity could involve the preparation of draft laws, regulations, management plans, and terms of reference for future projects to strengthen the capacity of wastewater management institutions. The recommendations are not intended to include detailed treatment of means for improving technology, marketing, financial management, and other aspects of the wastewater treatment and use. The authors should, however, indicate directions for future work which they feel would be beneficial.

THIRD CONSULTATION ON LEGAL ASPECTS OF WATER
RESOURCES, WATER SUPPLY AND WASTEWATER MANAGEMENT
(FAO, Rome, 14 - 16 September 1992)

ANNEX I

LIST OF MEMBERS OF THE FAO/WHO WORKING GROUP AND COMPOSITION OF COMMITTEES

FAO/WHO Working Group

Mr. B. Appelgren	Senior Officer, AGLW, FAO
Ms. I. Arce Umana	Legal Director, AyA, Costa Rica
Mr. C. Bonnal	Consultant, CGE, France
Mr. E. Brantly	Associate Director, WASH/USAID, Washington, D.C.
Dr. D. Caponera	Water Legislation Expert, Italy
Ms. M. Cardoso da Silva	Project Director, WHO/UNDP, Portugal
Mr. P. Chaix	Study and Co-operation Manager, NAN. C.I.E., France
Mr. E. Döring	Technical Adviser, GTZ, Germany
Mr. P. Faivre	Directeur aux Affaires internes., NAN.C.I.E., France
Mr. Y. Glemarec	Programme Officer, UNDP
Dr. F. Greiner	Senior Technical Adviser, GTZ, Namibia
Mr. S. Hameed	Parliamentary Legal Officer, Maldives
Mr. Y.A. Hassan	Dir. Public Health Eng., Min. of Pub. Works, Sudan
Mr. M. Ibrahim	Director, Water & Sanitation Authority, Maldives
Mr. J.G. Janssens	Technical Director, IWSA, Belgium
Mr. E.S. König	Sector Eco. Water and San., KfW, Germany
Mr. K. Kresse	Project Coordinator, CAPRE/ANDESAPA, Costa Rica
Mr. El M. Lamqaddam	Chef, Division Hyg. du Milieu, Morocco
Mr. J. Lau-Hansen	Health Legislation Editor, WHO/HLE
Mr. B. Locke	Deputy Execut. Secr., W&S Collaborative Council
Mr. A.H. Maiga	Sanitary Engineer, EIER/EPFL
Mr. P. Maritz	Deputy Permanent Secretary, Dpt. of Water Affairs, Namibia
Mr. M.A.M. Mullick	Regional Adviser (CWS), EMRO
Mr. U. Myint	Chief/Dept., Environ. Sanit. Division, Myanmar
Mr. B. N'Deurbelaou	San. Eng., Hydrosult Development S.A., Lausanne
Mr. Y.J. Picaud	Manager - East Africa Division, CEFIGRE, France
Mr. K. Podlaski	Directeur, Water Management, Poland
Mr. P. Ribadeneiro	General Manager, EMAP, Ecuador
Mr. J.A.V. Roxo Pires	Manager, U.N.D.P. Project, Portugal
Ms. T. Santa Maria	Legal Off., Compagnie Générale des Eaux, France

Ms. I. Sen	Joint Secretary, Ministry of Water Develop., India
Mr. S.N. Sharma	Dir. Gen., Water and Sew., Nepal
Dr. S. Shubber	Senior Legal Officer, WHO/LEG
Pr. H. Shuval	Director, Environmental Health, Univ. of Jerusalem
Mr. M. Solanes	Interreg. Adviser Water Law, UN/DTCD
Mr. M. Strauss	Project Officer, IRCWD, Switzerland
Mr. T. Tamplin	Reg. Adviser on Environmental Health, WHO/WPRO
Mr. C.D. Tripathi	Additional Secretary, Ministry of Urban Development, India
Mr. S. Valverde Segura	Aya, Costa Rica
Mr. J.T. Visscher	Senior Programme Officer, IRC, Netherlands
Ms. J. Walker	Associate Director, WASH, United States of America

Secretariat

Mr. S. Burchi	Legal Officer, Development Law Service, FAO, Rome
Mr. L. Laugeri	Institutional Development Specialist, WHO/CWS
Ms. F. Sigalotti	Secretary, WHO/CWS
Ms. J. Southwell	Secretary, Development Law Service, FAO

THIRD CONSULTATION ON LEGAL ASPECTS OF WATER
RESOURCES, WATER SUPPLY AND WASTEWATER MANAGEMENT
(FAO, Rome, 14 - 16 September 1992)

Composition of Committees

Committee I: Reallocation of Water Resources

Mr. B. Locke	Water Supply and Sanitation Collaborative Council, Geneva
Ms. M. Cardoso da Silva	Project Manager, Tejo Project, Portugal
Dr. D.A. Caponera	Water Law and Administration Consultant, Rome
Mr. F. Greiner	GTZ Chief Technical Adviser, Namibia
Mr. P. Maritz	Deputy Permanent Secretary, Dept. of Water Affairs, Namibia
Mr. B. Appelgren	Senior Officer, AGLW, FAO
Mr. Alex Spier	Senior Officer, DDC, FAO

Committee II: Water Supply and Wastewater Management

Mr. E. Brantly	Associate Director, WASH/USAID, Washington, D.C.
Mr. P. Ribadeneiro	General Manager, EMAP, Ecuador
Prof. H. Shuval	Hebrew University of Jerusalem, Jerusalem
Mr. C.D. Tripathi	Additional Secretary, Ministry of Urban Development, India
Mr. J.T. Visscher	Senior Programme Officer, International Water and Sanitation Centre, The Netherlands
Mr. K. Kresse	Project Coordinator, CAPRE/ANDESAPA, Costa Rica

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ANNEX II

SELECTED LEGAL AND INSTITUTIONAL ISSUES IN
WATER RESOURCES ALLOCATION AND RE-ALLOCATION

by D.A. Caponera
Water Legislation and Administration Consultant

I. Legal mechanisms for water resources allocation and re-allocation

a. Introduction

In general, water resources allocation means the distribution of the water available to different water users and for different purposes of use: domestic, municipal, agricultural, including irrigation, livestock watering, etc., hydropower generation, recreational and scenic, and last but not least, disposal of waste of diverse origins.

Water resources allocation is one of the two basic aspects of water resources management - the other being protection of water quality from pollution and contamination.

As water resources become scarcer relating to demand as a result of population growth, technological advances and improved standards of living, competition among water dependent sectors of economic and social activity augments. Consequently, the likelihood of social conflicts increases, and a need for conflict prevention arises.

Hence, we have the growing role of government as the "allocator" of water resources to competing users for a variety of purposes and as the regulator of water withdrawal from rivers, lakes and underground aquifers by users - be they private individuals or corporate users, or public sector users, including government.

This growing role of government in prevention is matched by a decreasing role of the courts as fora for the settlement of water conflicts and as "allocators" of water resources on the basis of litigation - conflict solution role.

b. Trends: permit system of water allocation

The trend to replace the settlement of conflicts in the courts with conflict prevention through government regulation is reflected in the water legislation of those countries which have adopted systems of water use concessions, permits, authorizations and licences.

Generally speaking, concessions are granted by governments for water uses involving a public service such as municipal water supply and sewerage, hydropower generation and distribution, and requiring large investment. They consist of an instrument of concession and of an attachment containing

detailed rules and regulations. Any change of conditions makes the concession subject to renegotiation between the government and the concessionaire. There is a rights/duties relationship; a termination of the concession before its expiration for reasons going beyond the responsibility of the concessionaire is the object of compensation.

On the other hand, permits, authorizations and licences, the definitions of which are generally synonymous, are granted for water uses that a government intends to control. These uses, if uncontrolled, may cause a diminution of the quantity or quality of the water resources or damage the environment. Their duration is shorter than that of concessions.

As no one of the instruments briefly described will be dealt with here in particular, we will employ the generic term "water use permit".

Water use permits are granted by the government, generally as a result of a process aimed at screening a proposed use for consistency with the water balance and with established policies, plans and priorities. Terms and conditions are written in the permit to adjust the withdrawal and use of the water to the physical circumstances of the case, to the policy goals pursued by the government and to existing plans. Of particular relevance is the fact that permits are typically subject to a term of duration. As a result, upon the expiration of such term, the water which had been allocated for use for the duration of the permit becomes available again - for use by the same user for the same purpose under a "renewed" permit or for use by another user for a similar or different purpose under a new permit. Generally, a procedure similar to the one followed in granting the former permit will have to be respected.

The fact that a permit has been granted by the government for a given water use does not mean that, once granted, the content and duration of the permit are immutable. The circumstances - physical or otherwise - which resulted in the grant of a particular permit may change during the life span of the permit and require some adjustment. An extreme but not infrequent case is that of a change brought about by a river basin or aquifer management plan calling for the permanent or temporary curtailment of existing and legitimate uses to ensure the sustainable use of the water resources in a given region. Another case for change may be that of a proposed new use of identified water resources when these have already been allocated to another user under a valid permit, and the two uses are totally or partially incompatible.

In these instances an existing, legitimate use of a given water resource comes under pressure to give way - in its entirety or only in part - to sustainability concerns and to a competing use. Furthermore, the pressure may come from the government in its capacity of "allocator" of the nation's water resources and as a result of a decision to favour a new proposed use, incompatible with the previous one on technical, economic or political grounds. Or, the pressure may come directly from the prospective user, who may induce his competitor to transfer his water right through a market mechanism of sale.

As the change occurs during the life span of the permit, the necessary adjustment cannot wait until the permit expires in order that a new permit be issued reflecting the new circumstances.

When water legislation introduces a permit system of water withdrawal and use for the first time or amends an existing permit in some significant respect, in most cases there are already legal rights existing.

In some countries where water is valued as a resource having economic, social or religious significance, its use is governed by rules of social behaviour known as customary law, having, as the very term implies, the force of the law. In other countries, rules of social behaviour have evolved through the court system and have been crystallized in the form of judicial precedent, having too, the force of law. This is generally true in countries adopting the common law system.

Whichever the case, by changing the rules governing the withdrawal and use of water resources, water legislation introducing a permit system may interfere with water rights - and privileges - which have accrued under the previous rules. In practice, as a result, water rights and privileges which were legitimate under the "old" customary - or court-developed - rules may become no longer legitimate under the new rules requiring a government permit. Hence, the need for water legislation that, when introducing a permit system ex novo, takes into consideration existing customary practices or court-developed rules

II. Major Issues

The introduction of a permit system for water withdrawal and use raises a number of legal and institutional issues, the most relevant of which, in general and in connection with the allocation and re-allocation of water resources for public water supply and agricultural uses, are the described herebelow.

a. Government water rights (water licensing) administration

A government water rights administration is the optimal configuration of the government water administration. In this case it is able to administer a system of permits for the use of water from surface and underground sources effectively, regardless of purpose of use.

In most countries, water management responsibilities are shared among a plurality of government ministries or agencies with administrative competences in various sectors of the economy: agriculture, public works, industry, etc. Where territorial subdivisions exist at the federal, national, regional, provincial or local level, territorial institutions have the same sectorial competences, perhaps in a reduced form. This situation is not conducive to an effective administration of water rights which requires a unified or coordinated water resources management mechanism. In addition, the solution of conflicts among water users would be facilitated. Such mechanism could consist of either a water rights administration at the appropriate level or an interministerial commission or committee for the coordination of the various sectorial institutions involved in a centralized water rights administration.

b. Re-allocation of water through administrative action

When the need arises for the government to review a permit during its life span and to curtail or suppress the water right under it for legitimate reasons, the issue is one of striking a balance between the sanctity of such

right and appurtenant security of tenure, on the one hand, and the imperatives dictated by public policy or a plan, on the other. While the water law cannot prescribe the kind of balance appropriate in all circumstances, it must provide decision-makers with procedural rules aimed at minimising the possibility for arbitrariness of administrative action such as the possibility for objection and review of proposed action and for appeal from decisions, and it must also provide substantive mechanisms to avoid undue hardship for users affected by such action, as for instance, compensation in cash or in kind for an existing user who is to be displaced in whole or in part by a new user.

In addition, water legislation, can provide substantive criteria for the orientation of the decision-making process itself, for example, by reference to the prescriptions contained in the water plan in effect or to a statutory order of priority uses of water.

c. Re-allocation of water through market mechanisms

The marketability of water rights, that is, their changing hands, kind and place or use through sale between a willing buyer and a willing seller, may occasionally become a political issue due to the peculiar nature of the resource being traded and to avoid speculation in water rights separated from the land tenure or ownership.

The issue is of particular relevance in relation to the shift from agricultural to urban water use, as a consequence of urban growth at the expense of agricultural land use.

In view of such political implications, water rights markets, where they are allowed to operate, tend to be regulated by water legislation aimed essentially at screening proposed market transactions for consistency with public policy goals.

In certain legal systems, the public can defend in the courts its "diffuse," non-property interests which are adverse to a market transaction involving a transfer of water rights.

d. Protection of pre-existing rights

When water legislation inaugurates or amends a permit system of water withdrawal and use, the issue is how to reconcile the new or amended permit requirements with the legitimate rights which have accrued to water users under the rules previously in effect.

In this regard, water legislation must provide mechanisms and inducements to bring "existing" uses within its field of application while avoiding undue and arbitrary hardship. This is usually accomplished, on substantive grounds, by introducing a variety of privileges and restrained governmental interference.

On procedural grounds, the review of, and appeal from, adverse administrative decisions, will minimize the possibility for arbitrary decision-making.

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ANNEX III

LEGAL AND INSTITUTIONAL ASPECTS OF WASTEWATER USE¹

The increasing recourse to wastewater to supplement dwindling freshwater supplies - in particular, treated municipal and domestic sewage to supplement irrigation and industrial needs, and, to a lesser extent, industrial effluents to supplement the needs of industry itself - raises two sets of legal/institutional issues.

On the one hand, the risk of detrimental impact of wastewater use on the health of the public - most notably, if foodstuffs are grown for human consumption with irrigation wastewater, or if treated wastewater is used to supplement drinking supplies - is so readily apparent that the need for regulatory restrictions as to permissible uses of wastewater, and acceptable wastewater treatment levels and effluent quality need not be elaborated.

On the other hand, intercepting the flow of wastewaters prior to their returning to a stream may impinge on the rights and interests of other downstream users of the waters of that stream, both for off-stream and in-stream uses. In addition, the diluting capacity of the stream may be adversely affected by reduced overall inflows and, as a result, also the legitimate rights of upstream and downstream waste dischargers, and environmental values, may suffer.

As a result, the use of wastewater may generate a number of conflict situations between the users of wastewater and the users of other water sources, and between the former group and the interest of the general public in a healthy aquatic environment. Legal mechanisms are therefore necessary to prevent such possible scenarios from ripening into overt conflicts, and to strike an acceptable balance among the various interests involved.

¹ This is the text of the section on "Conclusions" from the paper Legal Regimes for Wastewater Use - Comparative Legislation by S. Burchi, FAO, published in the Report of the First Consultation of the FAO/WHO Working Group on Legal Aspects of Water Supply and Wastewater Management, Geneva, 1990 (doc. WHO/CWS/90.19, Annex VI).

This is hardly the brief of the courts of law, which step in after a conflict has broken out, are ill-equipped to deal with complex technical issues, and whose decisions do not, in principle, have general applicability. This is why the more modern legislation tends to respond to the above concern by providing for mechanisms which seek to bring out in the open potential conflicts, and delegates the Government to arbitrate them on the basis of policies and criteria of general applicability.

Experience in other domains of legislation has taught that regulatory prescriptions tend to go unheeded unless teeth are added in the legislation to ensure compliance by the citizenry. In addition to penalty systems, the Government needs powers - from entry into private premises and inspection, to the forcible execution of a violator's obligations - necessary to deter on the one hand, and to remedy on the other, breaches of the law - subject, of course, to the checks and balances needed to prevent abuse.

As wastewater use touches on such diverse domains as freshwater resources management, irrigation, industrial and municipal water use, and public health and environmental protection, the spheres of competence of different Government departments and agencies may be involved. The need for mechanisms of coordination is readily apparent lest "territorial" disputes mar the implementation of wastewater use policies and companion legislation.

Finally, it is worth noting that, given the complexity of the technologies and techniques involved in the use of wastewater, delicate matters of technical detail tend to be left to subordinate regulations, with the main legislation only providing for the outlines of mechanisms and procedures designed to govern wastewater reuse. This lawmaking technique, while responding to a sensible partition between matters of principle and matters of detail, may nonetheless jeopardize the viability of the whole legislative package if the regulations giving the "details" are delayed.

Principles cannot be implemented until details have been spelt out in regulations - such as the acceptable quality of treated wastewater, or the acceptable wastewater treatment techniques, or standard specifications for wastewater treatment facilities.

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ANNEX IV

LEGAL REQUIREMENTS TO IMPROVE COMMUNITY WATER SUPPLY MANAGEMENT

by Louis Laugeri, CWS, WHO Geneva

One of the major concerns of the FAO/WHO Working Group on Legal Aspects of Water Resources, Water Supply and Wastewater Management has been that institutional development should be fostered in order to ensure the sustainability of services. The attainment of this objective requires a strong government commitment and a strict regulatory framework. While this is true of most objectives in the infrastructure sectors, in the particular case of water a number of characteristics facilitate as well as hamper development.

Development is obviously hampered by the disorganization of some water activities: drinking water supply for instance loses half of its product in developing countries, as more than 30% of water produced is usually unaccounted for, while an equivalent proportion is unpaid for other reasons. Development is also hampered by the extreme fragmentation of all water related activities, horizontally between a large number of planning, producing, financing, monitoring and user agencies, vertically between one or a few national or regional agencies with limited decentralization potential, numerous municipalities with scarce resources, and a very large number of consumption points, as half of the developing world's population live in dispersed habitat conditions which result in high costs in the provision of services.

The water sector is generally not well regulated. Some examples of areas are given below where there are gaps in legislation, or the legislation is not enforced or should be strengthened. The purpose of this preliminary list of examples is to open the discussion rather than lead the deliberations of the Working Group to specific areas of interest.

A. WATER

While sources of water become constantly more distant and polluted, water demand increases exponentially. In order to meet demand from sterile or decreasing resources, the factor by which water quantities are multiplied must increase exponentially. This factor determines the flow of funds to the sector; for purposes of simplification, it is assumed that this selling-price of water includes used water disposal and other environmental protection costs and subsidies are assumed to represent government contributions to total sector cost at factor price. The following issues should be addressed:

- a) the full selling-price of water must be paid, irrespective of actual cost: the full selling-price is what is required to achieve total coverage of needs and sustainability, rather than to cover already recorded costs; the legislation to govern this aspect should therefore be forward-looking rather than based on factual evidence;
- b) equitable and enforceable regulations to ensure cost recovery should be based on the delivery of a product (water) which people want (quantity/quality) at a price which they are willing to pay; this price is again unrelated to cost in terms of users' perceptions and motivations; it is based on performance, and improvements in quality (including quality surveillance), quantity and access conditions can help in the process of adjusting rates to economic costs and obtaining full users' participation;
- c) cost-containment measures remain however important in financial as well as economic terms. Financial cost-containment is self-explanatory; in economic terms, cost containment measures are those which facilitate optimum resource use, for instance wastewater use where it has the effect of partly offsetting sewerage and other environmental protection costs, increasing agricultural production and reducing the long-run marginal cost of water.

B. PEOPLE

People include those who supply water to the community, those who use water from the communal system and those who do not use this water, either because it is not accessible to them or because they prefer to rely on their own supplies and this preference is tolerated or encouraged. The following issues should be addressed:

- a) the legislation governing water supply agencies should be health-oriented and promote universal coverage of at least minimum needs. The divestiture of community water supply functions should therefore be accompanied by strict regulations and control to ensure that agencies fulfil their obligation of extending coverage rather than constantly improving services for the same beneficiaries;
- b) the tariff structures and relevant regulations should be oriented towards full cost recovery from all users. This requires that the poor should pay, and as differential tariffs are less and less effective in communities with fast-growing low-income groups, it also requires that all users contribute to the communal system, irrespective of their actual source of supply;
- c) the legal definition of cost should no longer be based on distinctions between construction and operational costs; it should include all elements of expenditures required to extend services to the entire population and to maintain needs' coverage overtime.

C. MONEY

- a) The private management of water systems and services is generally attractive to both public and private interests, in terms of cost recovery and cost containment; water supply is usually seen as more rewarding than used water disposal; public installations are less favoured than private connections. These efficiency considerations are usually valid and acceptable, but only to the extent that performance objectives do not result in depriving people of services, deteriorating the environment or mining the resources;
- b) for a permanent (dynamic) equilibrium to be reached between supply and demand, water incomes should be channelled into funds which revolve at rates calculated to provide for the coverage of operating expenses, the maintenance and replacement of assets and the expansion of facilities;
- c) the only feasible solution to the supply-demand equation of the water sector requires that depreciation be based on revalued assets and that all surplus from operations be immediately reinvested in new assets to both extend coverage and maintain a sustainable financial and physical development momentum.

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ANNEX V

LEGAL ASPECTS OF SURVEILLANCE AND CONTROL OF
COMMUNITY WATER SUPPLY

by H. Shuval²

GUIDELINES FOR DRINKING WATER QUALITY

Second Edition, 1992/3 (Reference in brackets correspond to notes at the end of the text)

Volume 3 - Surveillance and Control of Community Supplies (note 1)

Chapter 8 - Legal Aspects (Note 2) - Draft annotated outline

8.1 Legislative Basis

8.1.1 Laws, regulations and standards

Effective programmes to control drinking-water quality depend ideally upon the existence of adequate legislation, supported by regulatory standards and code. One of the functions of the basic law is to define the functions, authority and responsibilities of the water supply agency and the water quality surveillance agency. Standards and codes should specify the quality of the water to be supplied to the consumer, practices to be followed in selecting and developing water sources, in treatment and distribution and procedures for approving water supply systems from the water quality point of view. The precise nature of the legislation in each country will, of course, depend on national, constitutional, and other considerations.

Experience has shown that the basic legislation should be limited to general principles and that the authority to establish and revise drinking water standards, codes of practice and other technical regulations be delegated to the appropriate Minister in charge of assuring the quality of water supplies and the health of the public, preferably the Ministry of Health. If the authority to establish water quality standards and regulations and their enforcement is in the hands of a Ministry other than the one normally responsible for Public Health and/or Environmental Health, then

² Professor of Environmental Health, Hebrew University of Jerusalem. The paper was written as a draft contribution to Chapter 8 of WHO's Guidelines for Drinking Water Quality - Vol 3 on Surveillance and control of community supplies (second edition forthcoming) - the paper reproduced here is as drafted and revised by the author based on the review at this Consultation.

normally responsible for Public Health and/or Environmental Health, then consideration should be given to requiring that water quality standards be promulgated only after being approved by the Public Health or Environmental health authority so as to assure their conformity with health protection principles.

Some features commonly incorporated in such legislation include:

- a) Provision for the establishment and amendment of drinking water quality standards and guidelines, as well as regulations for the development of water sources and for the design, production and distribution of safe drinking water.
- b) Provision for the establishing the legal functions and responsibility of the water supply agency with the clear statement that it is the organization that sells and/or supplies water to the consumer, that it carries the legal responsibility to supply safe and wholesome water, meeting the legally established water quality standards; it is responsible for product liability and to provide for continuous and effective water quality assurance and control including inspection, supervision, preventive maintenance, routine testing of the water quality and remedial actions as required. It should be the legal responsibility of the water supply agency to notify the public when there is a problem of serious water quality deterioration that requires boiling of the water or other preventive steps. Failure to warn the public should be considered an offense.

The water supply agency should be responsible for the safety and quality of the water supply up to a defined point in the distribution system, generally up to the house connection or public stand-post.

In many cases a state-wide or regional water supply company or governmental organization supplies drinking water to a municipal water supply agency or a local water distribution company or group. In that case the primary supplier should be legally responsible for the water quality, as the "wholesaler" up to the point of connection to the pipelines of the local supplier. Then the organization that supplies the public directly becomes the "retailer". Both levels should carry legal responsibility for the water supply quality up to the stage where the product is delivered to their "customer".

Provisions are required for the water supply agency to cover the costs of the water quality surveillance function either by reimbursing the government department or by paying for the services of an authorized private surveillance organization with certified laboratory facilities. The cost of both the water supply agency's own water quality testing and control (or water quality assurance) program as well as the water quality surveillance should be recovered through the proper pricing of the water supplied to the customer.

Governments should also give consideration to make legal provisions that would enable individuals or community organizations to take legal actions through the courts, to enforce water quality standards and regulations. In addition consideration should be given to making legal provisions that would enable water supply agencies to initiate legal actions through the courts, to protect their water sources and

distribution networks from sources of water pollution. This is particularly important in areas where no effective government pollution control program is in operation.

- c) Provision for investing the surveillance agency with the powers to administer and enforce the laws, regulations, standards and codes concerning water quality. Provisions should also be made to allow for the delegation of those powers to other specified agencies such as a municipal council, local health department, regional authority, non-governmental (community) organization, university and a qualified government authorized private testing service.

Many countries lack such basic legislation and in others the existing legislation is seriously out of date. However, much can be done to assure drinking water quality under existing general health, food safety and welfare legislation as an interim measure. Implementation of programmes to provide safe drinking water should not be delayed because of lack of appropriate legislation.

Even in situations where legally binding drinking water quality guidelines or standards have yet to be promulgated it may be possible to encourage and even enforce the requirement to supply safe drinking water through educational efforts or commercial, contractual arrangements between customer and supplier based on civil law.

8.1.2 Application of water quality legislation

A. Short and medium term targets

For most developing countries, as well as many developed countries, it will usually not be possible to achieve all of the Guideline recommendations and goals in the first stage. Developing countries may be faced with a relative risk of disease and death from water contamination by pathogenic microorganisms that is 10-100 time greater than that resulting from exposure to chemical pollutants. Economic resources and manpower are usually limited. Thus it will be essential to develop a program of short and medium term targets in developing a water quality surveillance and control programme which provide a country with the choice to control the most significant sources of water borne risks confronting them in their specific local situation. It is important to draft the water quality legislation in such a manner as to allow for such flexibility in achieving water quality targets in stages.

The Guidelines for Drinking Water Quality were drafted, so as to be as comprehensive as possible in order to meet the needs of the most industrialized developed countries. They are, nonetheless, intended to meet the needs of the developing countries as well, who will hopefully apply them on a selective basis. The all inclusive nature of the Guidelines may result in their improper application and/or interpretation in developing countries. Many of the chemicals and organic micro pollutants listed are relevant, primarily, in situations where sources of drinking water are contaminated by hazardous chemicals from industry and agriculture. Such chemical are often not present in rural areas. In some cases, however, certain chemicals used in agriculture such as pesticides and fertilizers may be a source of serious contamination in rural areas.

Other guidelines may be so rigorous, that although they may be desirable, they may not be relevant or feasible, at least not in the early stages of a water quality control program. Most of the chemical guidelines have been developed using procedures and criteria suitable in the highly developed countries based on the possible chronic effects of life time exposure (70 years and more in the developed countries) to chemicals, while in most developing countries life expectancy is still much less. In many such developing countries, the health effects of water-borne infectious diseases may be of such dominating importance, that any investment of public health resources in monitoring and control of any but the most critical chemical standards of demonstrated local importance, would be irrational. Less stringent microbial guidelines may be justified in rural areas without compromising the health of the public.

The Guidelines clearly state that each country should evaluate their suitability to meet local needs. But this is rarely done. While adopting the World Health Organization Recommended Water Quality Guidelines, in full and without exception, as the legal standards, is often the simplest policy to follow for developing countries and the one that is most convenient politically, it may not always be the one that is correct from the overall public health point of view or socially and economically suitable to the local situation (see note #3).

Attempting to adopt all of the WHO Guidelines in an indiscriminate manner can result in a situation where drinking water standards adopted in a given country are not necessarily relevant to the country's real health problems associated with water quality. There is often little or no professional and/or economic capability to monitor and enforce these standards. In such a situation, where drinking water standards are neither relevant or enforceable, a serious problem of demoralization of water supply and public health personnel, and community leaders may result. This can lead to a total loss of confidence in all water quality standards and monitoring procedures and a sense of frustration and disrespect for all health and environmental laws and regulations, in general. It can even lead to a lack of faith in the overall legal and governmental system.

It is recommended that health and water authorities develop a clear strategy for the establishment of water quality goals in several stages - short term, intermediate and long term. A program based on modest but realistic goals including fewer water quality parameters and attainable levels consistent with providing a reasonable degree of public health protection, may in the final analysis achieve more, than an over ambitious program that will lead to frustration and eventual failure.

The drinking water quality legislation should clearly provide for the possibility that different standards be applied in different areas of the country or that differences between large, well designed, and well managed municipal water supplies and smaller community water supply systems be allowed for. This also can be in the form of temporary exemptions for certain communities or areas from specified water quality standards for clearly defined periods of time. The granting of temporary exemptions or deviations could be done by a highly qualified public health or environmental health official at the district, regional or national level who have been given that authority under the law or who have been delegated the authority by a more senior official who has been granted the right to delegate such authority. Another possibility is to establish two levels of standards: a "maximum

permissible" level which is feasible for most water supplies within a reasonable period and a "desirable" or "target" level which should be a goal to be strived for or achieved in a specified time period.

Interim standards, deviations and exemptions should be authorized under the law as part of a national or regional policy, rather than as a result of local initiatives or self interest. Water supply agencies should function on all matters relating to the quality of the water they supply, under the authority of laws and regulations set by a higher authority, rather than by establishing their own internal interim standards based on their own judgement or convenience. Such a legal framework is important both in assuring the protection of the public health and to protect the water supply agencies from being held liable for supplying "sub-standard" water.

B. - Compliance - the role of the water supply agency and the surveillance agency

Legislation should clearly define that the water supply agency is legally responsible for the continuous quality of the water sold and/or supplied to the consumer and for proper supervision, inspection, maintenance and safe operation of the water supply system. It is the water supply agency which actually provides water to the public - to the customer - normally on a commercial basis, which should, as the actual supplier/vender of the finished product, be legally responsible for its quality and safety from a public health, as well as a civil law point of view. The water supply agency should be held responsible for the quality of the water up to a defined point in the distribution system as mentioned previously. It should not be held legally responsible for deterioration of water quality within the household due to poor sanitation in storage tanks or poor plumbing. In the long run it should be the policy of health and water authorities to place the legal burden of the primary level of water quality control testing on the water supply agency. These agencies should develop the infrastructure necessary for quality control on a cost recovery basis as part of the price of the water. Principles of sound administration support this form of transfer of responsibility, in a decentralized manner, to the producer/supplier while assuring a system of independent surveillance with strict enforcement authority to determine whether the suppliers are fulfilling their responsibilities.

The legislation should empower the appointed surveillance agency to enforce compliance with the water quality standards and regulations by carrying out independent, external, periodic audits of all aspects of water quality and safety including sanitary surveys, and spot checks on a statistical basis. The results of the audits should be reported to the water supply agency with the requirement that remedial action be taken.

Surveillance should first and foremost be understood as a support and advisory function and only secondarily as an enforcement and sanctioning function. Appropriate forms of sanctions should however be specified in the law, ranging from the obligation to warn the public including to post notices requiring the boiling of water when microbial contamination is detected, fines for violations, including continuing fines for continuing violations and even the closing down of systems which represent severe hazards to the public health. This latter option may not be feasible in situations with a single

water source. Consideration should be given to the possibility of holding water supply agency management personnel liable for serious offenses involving personal neglect and mismanagement. This has been found to be effective in certain countries. The surveillance agency should be required by law to publish annually the results of their surveillance work or at least provide free public access to all of the water quality surveillance results in a form that is meaningful and easily understood by the general public.

While remedial action to assure the expeditious correction of faults should be the main aim of the surveillance program, there may at times be a need for strong sanctions to assure compliance. The surveillance agency must have at its disposal legislation with "teeth", but to be effective the agency must have the wisdom and determination to know when and how hard to "bite" to assure compliance with water quality regulations.

C. - Surveillance requirements

The legislation should define the duties, obligations and authority of the water quality surveillance agency. It is recognized that the water supply agency will, by definition, have a vested interest and may not always fulfil its obligation to assure the quality of the water it supplies. Legal and organizational arrangements aimed at ensuring compliance with the legislation, standards, or codes of practice for drinking water quality must provide for the establishment, wherever feasible, of an independent surveillance agency. Often the optimum organizational structure for the surveillance agency would be to empower a governmental agency, (preferably, but not always the Ministry of Health), with qualified professional personnel and laboratory facilities which operate at the national, regional and local level. In many developing countries however, Ministries of Health or other surveillance agencies, while possessing sanctioning power under the law, have little or no surveillance resources and are thus totally ineffectual. The delegation of the surveillance function to a qualified government authorized private surveillance service should be carefully considered as an alternative approach.

D. - Sampling frequencies and parameters

Frequent inspections, sanitary survey and water quality testing, particularly for microbial contamination, are essential elements in any surveillance program to assure that the quality of the drinking water meets the standard that has been established. However, in the early stages of a water quality control program, facilities may not be available to test for all the chemical parameters included in the Guidelines. Even if all the Guideline values have been incorporated into the national drinking water standard, it is essential that clear directives be established as to which parameters must be tested for and at what frequency. In rural areas, where water sources are not normally exposed to industrial wastes or agricultural chemicals, the testing for most micro-pollutants is neither warranted nor feasible. It is important that realistic and flexible sampling frequencies be established and those only for the relevant parameters. The main water legislation should not include sampling frequencies but should enable the administration to establish the list of parameters to be tested for and at what frequency. However, it

must be emphasized that water quality surveillance is not solely or even mainly based on laboratory tests but on regular inspections and sanitary surveys with recommendations for remedial actions. This also requires follow-ups to determine whether the required remedial actions were taken.

E. - Prescribed analytical methods

It is essential that analytical procedures for water quality tests be prescribed in the drinking water standards or regulations so as to assure that accepted, standardized, reliable and accurate methods are used by all agencies and laboratories involved in water testing. This is particularly important in cases where litigation may be necessary. At times, simpler and less expensive methods will be accepted, for certain routine tests in areas remote from qualified laboratories. The legislation should allow for such alternative methods in certain circumstances. Regulations should also require that quality assurance procedures be introduced and monitored for in government water supply agencies and certified private laboratories carrying out water quality testing.

8.1.3 Technical regulations: construction, operation, plumbing codes, etc.

An important element in the assurance of water quality is the proper source selection, design, construction and operation of water supply facilities. For example, technical regulations should require that in the selection of water sources, that the best possible source of pure water be preferred over alternatives, and that systems be designed to assure the protection of the water quality by effective multiple barriers of protection. These matters can be covered to some extent by technical regulations and codes which form part of the water quality legislation. However, caution should be paid to avoid the danger of overly rigid construction and plumbing codes which can be changed only by complicated and slow legislative procedures. Such technical regulations and codes should allow for relative ease in modifying them to meet new technology developments and the need to allow for the introduction of low cost interim methods under certain circumstances.

8.2 National Strategies

This section has been omitted (see Note 5).

NOTES

NOTE #1 - The Consultation recommended that the title of Volume 3 be changed to "Water quality surveillance and control" so as to emphasize the two tier concept of surveillance.

NOTE #2 - The proposed title and outline of Chapter 8 differ from the proposal contained in the report of the review meeting on volume 3 held in Harare, Zimbabwe, June 1991 and the outline of Chapter 8 in the "final draft" of the second edition of volume 3 "Institutional and Legal Aspects". This was done in order to avoid duplication of the extensive material on the institutional aspects in Chapter 1. Thus the proposed Chapter 8 has been limited to the "legal aspects".

NOTE #3 - Volumes 1 and 2 of the Guidelines for Drinking Water Control, contain recommended guideline values for chemicals and microorganisms in water and the scientific rationale behind them. Thus they are aimed primarily at top level professional water and public health officials who participate in setting national standards and their interpretation, as well as in developing and determining national or regional strategies and tactics in the field of water quality and health. Volume 1 and 2 are also aimed at managers and operating personnel in larger cities or in water supply organizations and companies, especially those involved in the chemical and microbial testing and monitoring of water supplies.

Volume 3, on the other hand is aimed primarily at water and health managers and to a certain extent field workers at the local level who are involved in the day to day management and control of water quality in rural areas, medium sized villages and towns and peri-urban communities which are not connected to the urban distribution system. In this Volume, according to the policy laid down for the first and second editions, the main emphasis is on microbial quality of water supplies and the prevention of water-borne infectious disease which is by far the most important public health problem associated with water quality in most non-urban community water supplies.

Because of its goals and audience, Volume #3 is a "How to do it" manual written in a popular manner, essentially aimed at the tactical and field level personnel. Chapter 8, "Legal Aspects", would therefore be more appropriately included in volumes 1 or 2. The legal aspects are essentially national policy and strategic questions, normally associated with national or regional level water quality planning and administration. This question was raised at the Harare review meeting, where a number of participants felt that Chapter 8 might be more suitable in Volume 1 or Volume 2.

NOTE #4 - The author recommends that a highly qualified group of environmental health scientists and toxicologists together with experts who understand the priority needs of developing countries be assigned the task of developing a recommended basis for establishing interim goals, including a series of "acceptable interim exposure periods" rather than life time exposure levels. Consideration should also be given to the relative risk of water borne communicable diseases versus the risk of chemicals. Health personnel in developing countries usually have neither the professional competence nor the political will to make such politically difficult compromises. They will be more likely to promulgate reasonable interim standards, which are more lenient than those recommended in the guidelines, if they can base their action on the prestige and credibility of an official WHO publication.

NOTE #5 - The report of the Harare review meeting recommended that a section on "National Strategies" be included in Chapter 8. This recommendation is not consistent with the stated goals and intended audience of Volume 3. Since it is the intention that Volume 3 be written primarily for community water supply managers and field staff at the local level, "National strategies" mainly aimed at the national level personnel should be omitted.

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ANNEX VI

LIST OF PROJECT IDEAS *

1. Describe and test legal mechanisms for managing groundwater abstraction.
2. Describe and test legal mechanisms for protecting groundwater quality, especially from contamination with agricultural pesticides.
3. Describe and test legal mechanisms for creating and managing private markets in water rights, as a means of allocating such rights.
4. Develop and test model laws providing for the control, treatment, and use of wastewater.
5. Describe and test the legal structure required to facilitate various forms of private sector involvement in water supply, from contracted services to equity investments.
6. Develop and test a water quality code for a selected developing country, which code includes water quality standards appropriate to the country and provides for the phased implementation of standards that are more stringent or address additional pollutants.
7. Develop and test legal mechanisms providing for private sector implementation of routine monitoring and surveillance of drinking water quality.

* Generated in discussions in the plenary session of 14 September 1992.