Public Attitudes about Water Quality in the HUA

R. L. Mahler, B. A. Lolley, and K.A. Loeffelman

The Idaho Snake-Payette Rivers Hydrologic Unit Area (HUA) Water Quality Project was one of 74 projects funded nationally by the United States Department of Agriculture (USDA) designed to improve water quality. The purpose of these 8-year, federally funded projects was to accelerate the transfer of technology necessary to protect ground and surface water quality while maintaining farm profitability. This project had three phases: (1) the determination of surface and groundwater quality problems in the study area; (2) the development of best management practices (BMPs) to solve identified problems; and (3) the implementation of state-of-the-art BMPs on farms in the study area to improve surface and groundwater quality. *BMPs are management strategies that protect water quality without adversely impacting the profitability of farms.* Three USDA agencies provided leadership for this project: the Natural Resource Conservation Service (NRCS; formerly the Soil Conservation Service), the University of Idaho Cooperative Extension System (CES), and Farm Services Agency (FSA; formerly the ASCS).

The Idaho Snake-Payette Rivers (HUA) Water Quality Project includes more than 840,000 acres in Canyon, Gem, Payette and Washington counties in southwestern Idaho (Figure 1). Within this geographic area are more than 3,400 farms covering more than 500,000 acres. Virtually all of the highly productive farmland is irrigated and the type of agriculture practiced is diverse, as more than 40 different crops are grown.

A competitive grant USDA grant awarded to the NRCS, FSA, and CES allowed the HUA project to hire staff in a centrally located office. NRCS personnel provided the technical assistance necessary for BMP implementation. The FSA provided the cost-share assistance for BMP implementation, while CES provided educational and technical BMP information to individual growers. This geographic area was chosen for federal funding because of the serious concern that agrichemicals (nutrients and pesticides) are a threat to groundwater quality and that sediments, nutrients, and pesticides have adversely impacted surface water quality.

Why Conduct this Survey?

Another goal of the Idaho Snake-Payette Rivers Hydrologic Unit Water Quality Project was to identify local perceptions and priorities on water issues so that future programming and water policies may address public needs and concerns. The specific objectives of this survey were to determine: (1) the awareness of the general public about water quality and water quantity issues; (2) the literacy

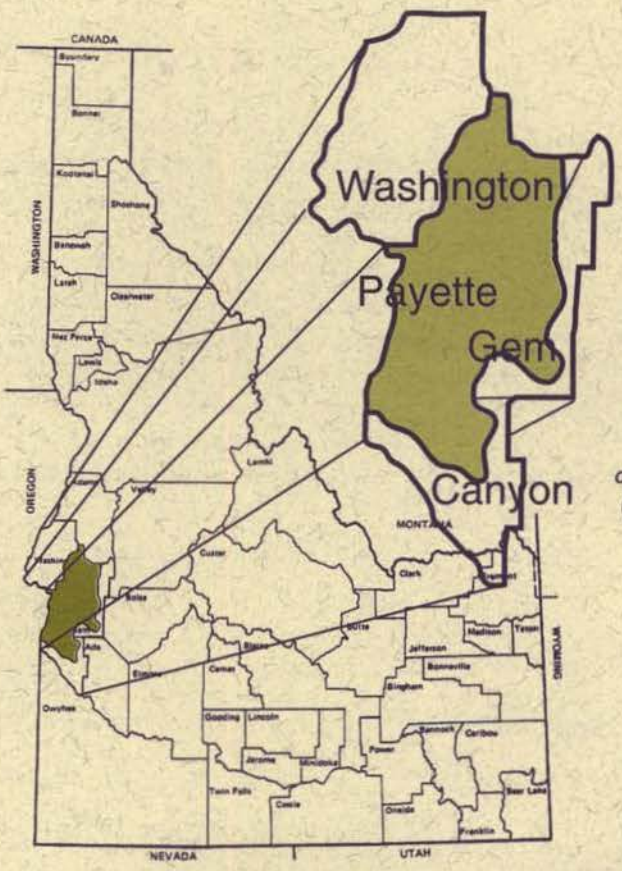

Figure 1. Map of the Snake-Payette Rivers Hydrologic Unit Water Quality Project area, and the counties included (project area is shaded).

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of the general public about drinking water contaminants; (3) the public's view about agriculture's impact on water quality; (4) the importance of specific water quality and water quantity issues to the public; (5) how and where the public currently obtains water quality and/or water quantity information; and (6) the awareness of the general public of agricultural BMPs and/or the Idaho Snake-Payette Rivers Hydrologic Unit Water Quality Project.

Survey Logistics

A written-response water issue survey was designed to solicit public opinion about community water issues, problems and possible solutions. A written-response design was chosen because of a lower possibility of bias, increased anonymity resulting in more honest answers, and the ability of the respondent to dictate the pace of answering the survey.

The survey had a total of 53 questions, and was sent to 912 residential addresses in the HUA project area. However, the actual sample size was 800 residents because 112 surveys were undeliverable. The process was designed to result in a completed survey return rate in excess of 50 percent. Four mailings were used to achieve this return rate. The first mailing, which took place in June 1996, included the water issues survey form, a business reply envelope and a cover letter describing the purpose of the survey. The second mailing occurred two weeks later and consisted of a postcard that stressed the importance of returning the completed survey form. One month later, the third mailing was sent to residents who did not respond to the first or second mailing. This mailing included a reminder letter, another copy of the water issues survey, and a business reply envelope. The fourth mailing consisted of another postcard reminding the residents to fill out the survey and return it. After four mailings, a return rate of 55.8 percent with a sampling error of +/- 5 percent was achieved.

Survey Demographics

The age distribution of respondents is shown in Figure 2. More than 40 percent of the respondents were at least 60 years old. Conversely, only 3.9 percent of the respondents were less than 30 years old. Seventy percent of the respondents were male, while 29.6 percent were female. Idaho natives comprised 45.6 percent of the respondents, while 54.4 percent were born outside of Idaho. Twenty-six percent of the respondents indicated they currently live on farms; most farm sizes were less than 50 acres. Educational levels for respondents ranged from those with less than high school diplomas to those with advanced college degrees (Figure 3). Approximately one-quarter of the respondents had four-year college degrees or more, while 42.0 percent of the respondents' education did not advance beyond the high school level.

Demographics of the survey respondents were somewhat different than demographics of the combined counties in the HUA watershed based on census data. Just over 85 percent of the survey respondents had at least a high school diploma, while only 70.1 percent of the residents of Canyon, Gem, Payette, and Washington counties had the equivalent education level based on census data. The sampled population was more educated, older, and more male than the region's population; however, we still considered the sampled population to have views representative of the region.

Public Awareness of Water Quality and Water Quantity Issues

A majority of survey respondents rated both surface water quality and groundwater quality either excellent or good in southwestern Idaho (Figure 4). When the excellent and good responses were added together more respondents felt that groundwater quality was excellent or good than surface water quality (71.1 vs. 56.6 percent). Even though the majority of respondents indicated that water quality was good or excellent, 43.0

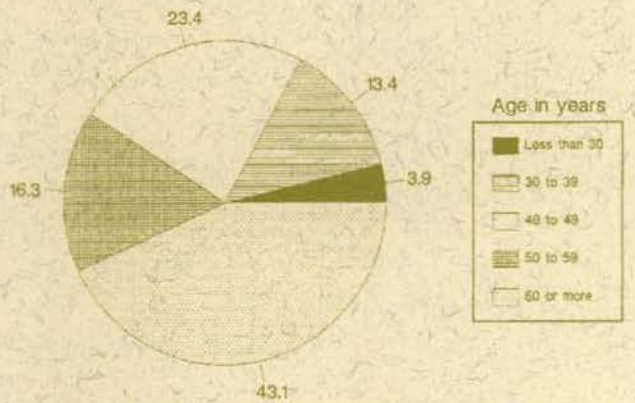

Figure 2. Age distribution data of the respondents to the water issues survey conducted in southwestern Idaho in 1996.

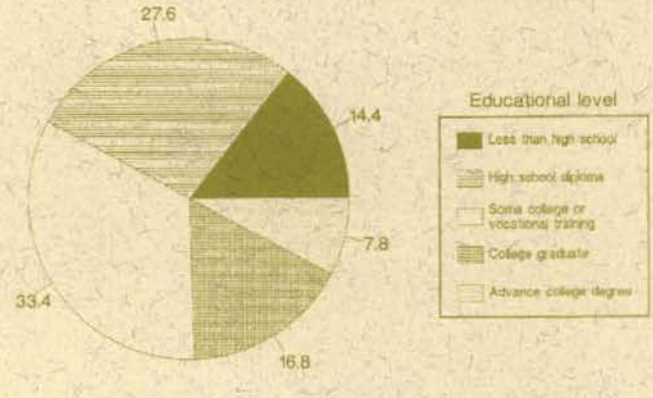

Figure 3. Educational level distribution of the respondents to the water issues survey conducted in southwestern Idaho in 1996.

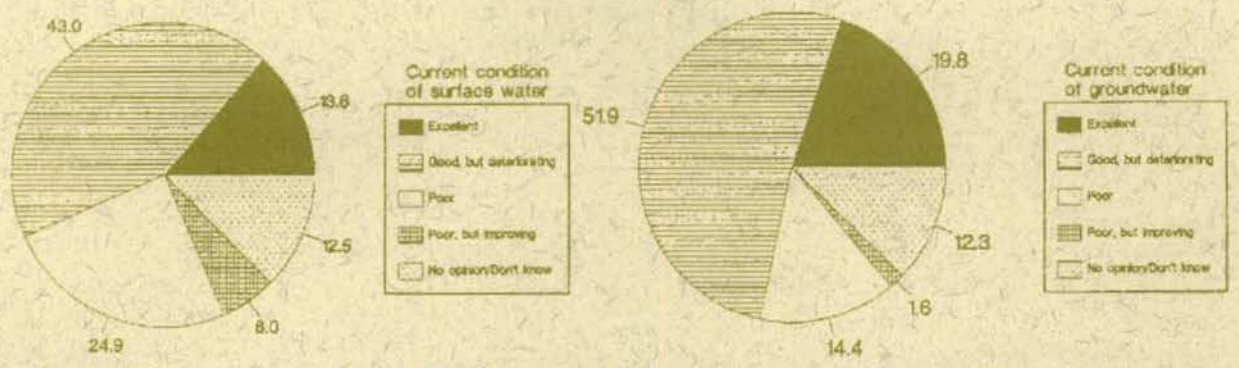

Figure 4. Public views on groundwater and surface water quality based on water issues survey conducted in southwestern Idaho in 1996.

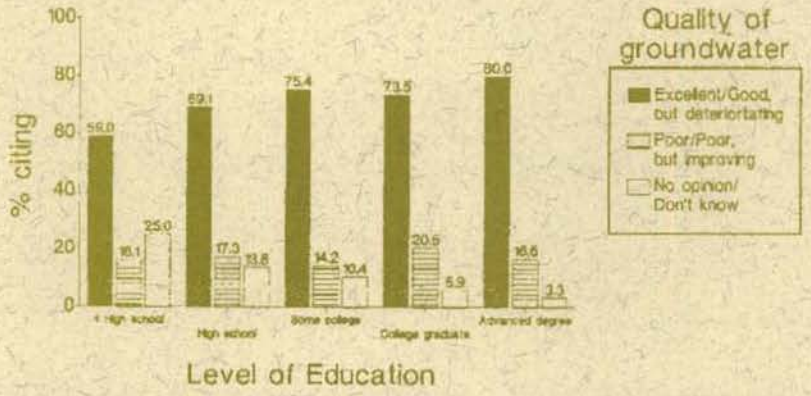

Figure 5. The influence of education level on public views about groundwater quality based on the water issues survey conducted in southwestern Idaho in 1996.

percent felt that surface water quality was deteriorating, and 51.9 percent sensed a similar deterioration in groundwater quality.

Different segments of the population had differing opinions on the quality of ground and surface water (data not shown). A larger percentage of males (74.7 percent) than females (63.0 percent) felt that groundwater quality was either good or excellent. Idaho natives were more optimistic about groundwater quality than non-natives (77.6 percent vs. 65.7 percent).

As the education level of the population increased from less than high school to college graduate, the opinion on the quality of groundwater became less optimistic (Figure 5).

The surveyed public had definite views about the water quality of the three major rivers in the watershed. More than two-thirds of the respondents identified the Snake River as being dirtier than the Payette and Weiser rivers (Figure 6). Males were much more likely than females (78.3 percent vs. 43.5 percent) to label the Snake River as dirtiest.

Public Literacy about Drinking Water Contaminants

Public literacy about drinking water was measured by respondents' perceptions of nitrate-N, pesticide, and mineral contamination sources. Nitrate-N and pesticide contamination is often associated with agricultural practices, while mineral contamination usually is associated with geological factors. On the whole, the respondents expressed moderate to good literacy about the sources of water contamination. For instance, more than 67 percent attributed geological factors as the prime cause of minerals in water, while 64.7 and 78.5 percent attributed agriculture as the most likely source of nitrate-N and pesticide contamination of water, respectively (Table 1).

Public literacy about the major sources of bacteria, heavy metals, and industrial contaminants in drinking water were also judged to be good. When asked about the degree of problems caused by bacteria, nitrates, pesticides, industrial pollution, heavy metals, and minerals in drinking water, the vast majority of respondents did not identify contaminants as a noticeable or an extreme problem (data not shown). The most often identified drinking water pollutant was minerals (32.9 percent noticeable or extreme problem). Less than 5 percent of the respondents identified bacteria, nitrates, pesticides, heavy metals, or industrial chemicals as an extreme problem in drinking water. When compared to the national average, a majority of respondents said that all contaminants in drinking water in southwestern Idaho were present at levels either less than, or at the same contamination levels observed nationally (based on data from EPA National Pesticide Survey).

Agriculture's Impact on Water Quality

More than 42 percent of the survey respondents felt that crop production was the main cause of contamination in rivers in southwestern Idaho (Figure 7). More than 59 percent of the respondents cited agriculture (crop production and/or

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Table 1. Public views on the major sources of bacteria, nitrates, pesticides, heavy metals, industrial chemicals, and minerals in drinking water in southwestern Idaho based on the 1996 water issues survey.

Sources of contaminaton	Pollutant					
	Bacteria	Nitrates	Pesticides	Heavy metals	Industrial chemicals	Minerals
	% citing					
Agriculture	19.3	64.7	78.5	9.2	17.4	7.8
Erosion	3.0	3.4	0.6	8.8	2.1	12.0
Geology of region	5.0 6.8	2.2	39.0 2.8	67.5		
Industrial/food processing plants	13.3	8.6	3.5	25.7	61.9	5.8
Ineffective sewer treatment plant	22.0	4.8	2.5	6.6	7.8	3.9
Lawns and gardens	0.0	6.2	11.0	0.7	2.5	1.3
Leaking landfills	5.3	2.4	0.9	8.8	3.9	0.6
Septic systems	32.0	3.1	0.6	1.1	1.4	1.0

Table 2. The relative importance of water-related issues to the general public living in the Idaho Snake-Payette Rivers Hydrologic Unit Water Quality Project watershed.

Issue	Importance of issue					
	Extremely important	Very important	No opinion	Somewhat important	Not important	Total
	% citing					
Clean rivers	35.2	54.8	0.5	9.5	0.0	100.0
Clean groundwater	54.7	40.6	0.9	3.8	0.0	100.0
Clean drinking water	68.1	30.8	0.0	1.1	0.0	100.0
Not enough water	55.2	35.2	3.8	5.4	0.2	100.0
Salmon extinction	16.9	27.4	10.3	31.6	13.8	100.0
Water for recreation	15.9	38.2	5.2	34.4	6.3	100.0
Loss of wetlands	24.0	32.7	5.4	28.0	9.9	100.0

cattle operations) as the major cause of surface water contamination. Urban wastes were also considered a main cause of river pollution (28.6 percent), but these wastes were not cited nearly as often as agriculture. Agriculture is probably most often cited because the public links the brown color of river water with sediment runoff from agricultural fields.

Respondents born in Idaho were less likely to cite agriculture than non-natives (48.9 percent vs. 69.6 percent) as the major source of river contamination (data not shown). Natives were more likely than non-natives to blame river pollution on urban wastes (37.8 percent vs. 20.6 percent).

Even though the general public felt that agriculture had an adverse impact on water quality, respondents did not feel that a majority of farmers used excessive amounts of water, pesticides, or fertilizers. As a group, 21.5, 20.5, and 28.9 percent of the respondents felt that all or most homeowners used too much fertilizers, pesticides, and water respectively (data not shown). Conversely, 15.4, 18.7, and 10.9 percent of the survey respondents felt that most or all farmers used too much fertilizers, pesticides, and water, respectively.

These results show that even though the public attributes many aspects of river water pollution to agriculture, they do not indict all farmers. In fact, based on poll results, the public in southwestern Idaho may feel that a rather small portion of the farmers cause most of agriculture's share of water pollution in surface waters.

Important Water Issues

Based on survey results, the environmental issues that concern survey respondents the most are those related to having enough clean water for consumption (drinking) and human health (Table 2). By combining the responses of "very important" and "extremely important" to a specific water issue, the relative importance of each issue can be discussed. Based on this criteria, southwestern Idaho residents ranked the following water issues from most important to least important as follows:
clean drinking water (98.9 percent very + extremely important), clean groundwater (95.3 percent), not enough water (90.5 percent), and clean rivers (90.0 percent). As a group, southwestern Idaho residents were

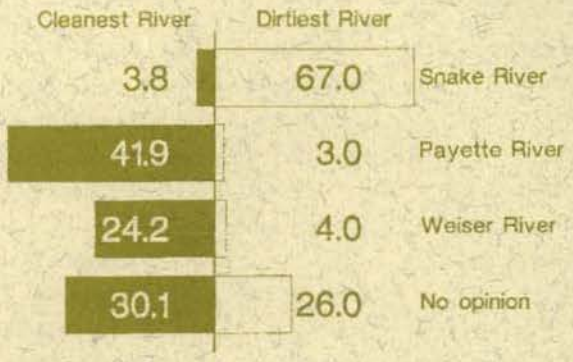

Figure 6. Public rating of cleanest and dirtiest rivers in southwestern Idaho based on the water issues survey conducted in 1996.

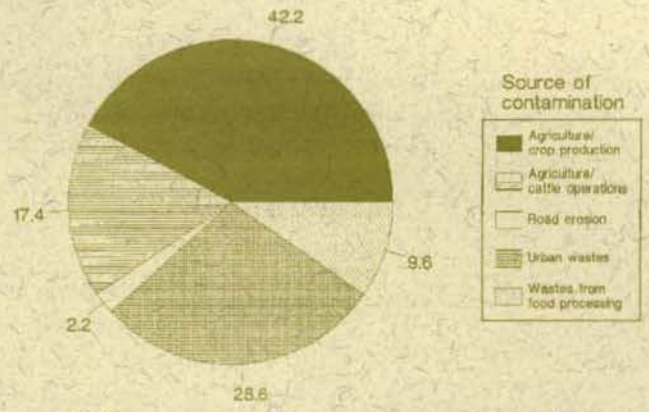

Figure 7. Public perception of the major source of river pollution in southwestern Idaho based on the 1996 water issues survey.

less concerned about the loss of wetlands (56.7 percent), water for recreation (54.1 percent), and salmon extinction (44.3 percent).

The age of respondents affected attitudes toward clean rivers, clean groundwater, clean drinking water, and the loss of wetlands (data not shown). In general, respondents less than 40 years old tended to be more concerned about those issues than people older than 40.

Respondents that were not Idaho natives generally considered the salmon issue more important than natives (48.1 percent vs. 41.2 percent very + extremely important).

Sources of Water Information

The majority of the general public in southwestern Idaho receives its water information from three agencies - the Idaho Department of Water Resources (IDWR), local health districts, and Soil and Water Conservation Districts (SWCD) (Table 3). All three agencies are very visible in southwestern Idaho. The local health district and Soil and Water Conservation Districts have several offices within the watershed and thus serve as excellent water information sources. The Idaho Division of Environmental Quality (IDEQ), University of Idaho (UI) and Environmental Protection Agency (EPA) fall into the next tier of water information providers. Based on sources of water information the Idaho Department of Agriculture (IDA), Bureau of Reclamation (BOR), Cooperative Extension System (CES), Farm Bureau (IFB), and USDA-Natural Resources Conservation Service (NRCS) fit into the third tier. Less than 6 percent of survey respondents identified the Nature Conservancy, United States Geological Survey (USGS), or Idaho Conservation League (ICL) as a source of water information.

The majority of the survey respondents use both the newspaper and television as media sources of water quality information (Figure 8). Another 31.7 percent of the respondents indicated that they have received information through Cooperative Extension System brochures. Less than 12 percent of respondents use magazines, radio, or computers as media sources of water quality information.

The coverage of water information in Cooperative Extension brochures and water quality magazines is much greater than in the newspapers and television. The high saturation of households with televisions and newspapers result in most water

Table 3 The primary public and private agency sources of water quality and water quantity information for residents living in the Idaho Snake-Payette Rivers Hydrologic Unit Water Quality Project watershed
(Note: residents could choose 4 sources)

Water information source	Percent citing
Idaho Department of Water Resources	69.9
Local Health District	56.4
Soil and Water Conservation Districts	54.2
Idaho Division of Environmental Quality	30.6
University of Idaho	26.3
Environmental Protection Agency	26.1
Idaho Department of Agriculture	21.1
Bureau of Reclamation	18.7
Cooperative Extension	16.0
Farm Bureau	14.6
USDA-Natural Resource Conservation Service (NRCS)	12.8
Nature Concervancy	5.4
United States Geological Survey	4.5
Idaho Conservation League	3.6

quality information being inadvertently obtained while possibly watching television or reading the newspaper for other news items.

Agricultural BMPs and the HUA Project

Even though a primary goal of the Idaho Snake-Payette Rivers Hydrologic Unit Water Quality Project was to educate all citizens within the geographic watershed, almost 70 percent of the respondents had never heard of the project (Figure 9). Only 2.4 percent had received information directly from the project, while another 25.3 percent of the survey respondents indicated that they had read about the project. Based on this data, it is obvious that a less than satisfactory effort was made by the project staff to educate the general public about the project. However, the fact that most people get their information from television and newspapers based out of Boise, Idaho, may have made media penetration into homes in the watershed difficult.

After education about the project and current agricultural BMPs, the majority of respondents believe agricultural BMP technology has progressed far enough to achieve sustainability. More than 62 percent of the survey respondents felt that the HUA project would either have some impact or a great deal of impact on water quality in the watershed (Figure 10). Only 6.7 percent of the respondents felt that the HUA project would have no impact on water quality.

More than 53 percent of the survey respondents felt that it was definitely possible to produce enough food for the human population without degrading the environment using current technology (Figure 11). These numbers are encouraging as the public appears to have faith in BMPs to protect water quality. Another 40 percent of the respondents thought that it might be possible to produce enough food while still protecting the environment. When the definitely possible and might be possible answers are added

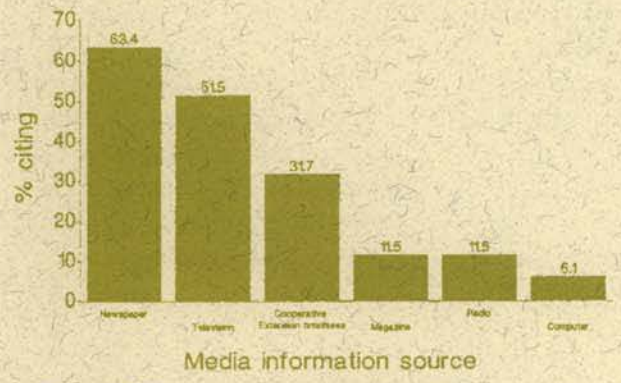

Figure 8. The primary media sources of water quality information for residents living in the Idaho Snake-Payette Rivers Hydrologic Unit Water Quality Project watershed (note: residents could choose two choices).

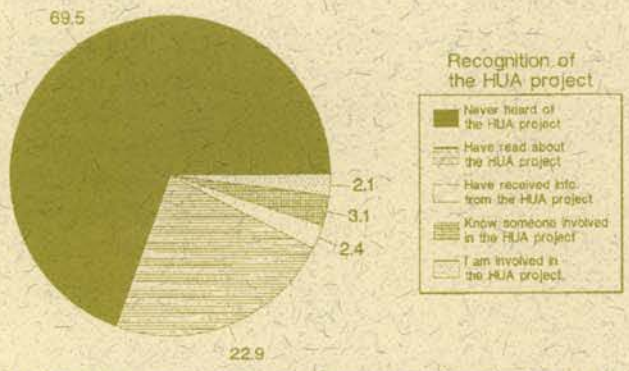

Figure 9. Relative familiarity of survey respondents with the Idaho Snake-Payette Rivers HUA Water Quality Project.

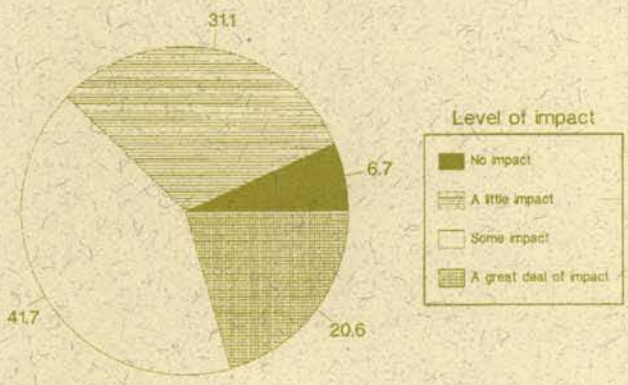

Figure 10. Public attitude about the potential impact of the Idaho Snake-Payette Rivers HUA Water Quality Project.

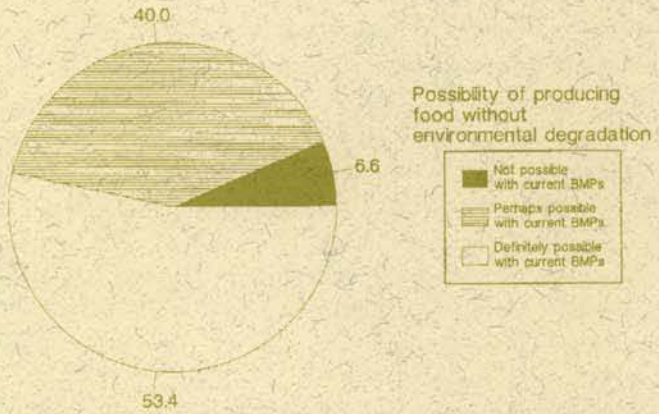

Figure 11. The feasibility of producing enough food for the human population without degrading the environment using current best management practice (BMP) technology in agriculture.

together, more than 93 percent of the respondents believe that it is possible for commercial agriculture and the environment to co-exist. The fact that the vast majority of respondents believe that technology has progressed far enough for sustainability to be achieved also indicates that respondents do not believe that technology keeps producers from using more sustainable means of food production. This may translate that respondents expect better farming techniques from the farmers than they currently receive.

The survey results showed an increased confidence in agricultural sustainability with increased level of education (Figure 12). Most survey respondents believe in implementation of agricultural BMPs to protect water quality; however, only 38.8 percent of the respondents felt these BMPs should be mandated by the government (Figure 13). to protect water quality were not necessary.

The idea of government intervention in farming is not favored by a majority of people in southwestern Idaho based on this survey. A case can also be made that respondents do not feel water quality problems are currently urgent enough to require government involvement.

When asked if subsidies should be paid to farmers to initiate BMPs to protect water quality, the respondents were split, as 55.0 percent were against subsidies compared to 45.0 percent favoring subsidies for BMPs that would protect water quality. It is interesting to note that the respondent's age had an impact on the subsidy question response. A majority of respondents aged 49 or less were in favor of subsidies, while a majority of respondents aged 50 or more were against subsidies (Figure 14).

Residents in the Idaho Snake-Payette Rivers Hydrologic Unit Water Quality Project watershed have very little knowledge of the HUA project. The overall regard for current BMP technology is good, with most survey respondents feeling that BMPs to protect water quality would have some or a great deal of positive impact on water quality, while allowing agriculture to produce enough food for the human population. There appears to be an attitude of trust that the majority of farmers will employ BMPs to protect water quality voluntarily.

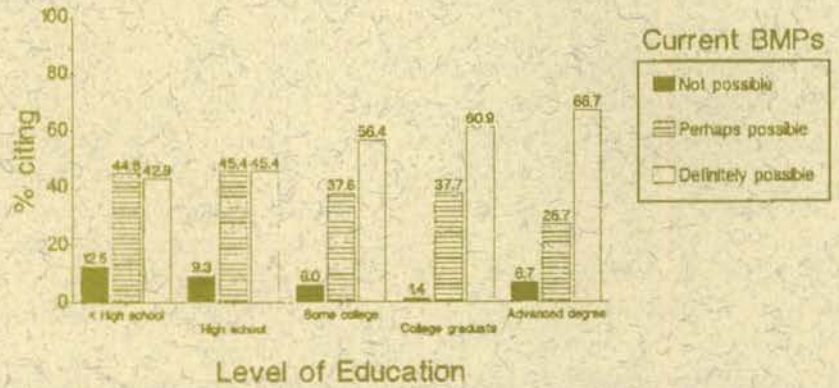

Figure 12. The influence of educational level on public views of the feasibility of producing enough food for the human population without degrading the environment using current BMP technology in agriculture.

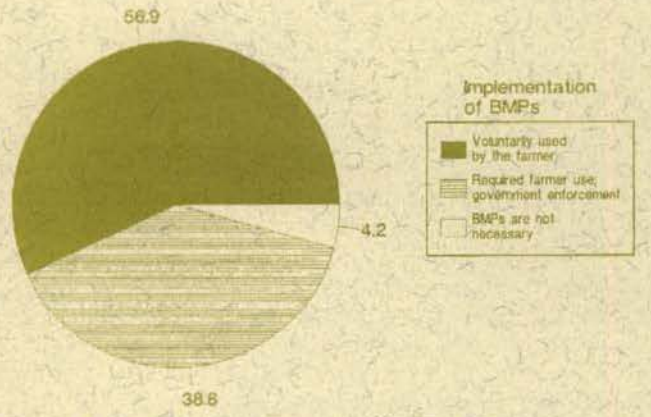

Figure 13. Public views on the need to use BMPs by the agricultural community to protect water quality in southwestern Idaho.

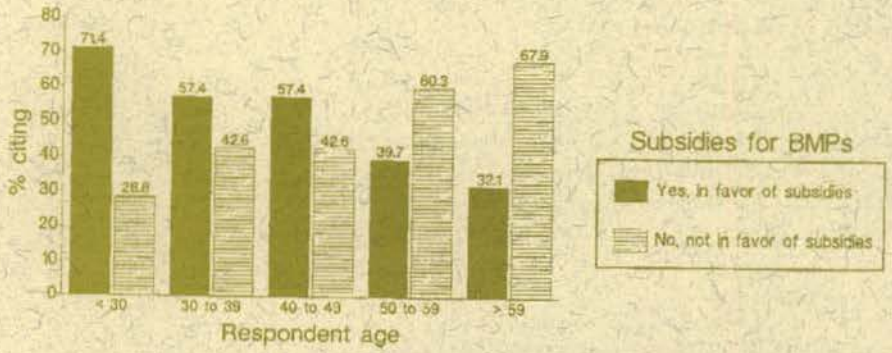

Figure 14. The impact of survey respondents' age on views about paying subsidies to farmers to use BMPs that protect water quality.

Summary

The Idaho Snake-Payette Rivers HUA Water Quality Projects' water issues survey found the following:

- A majority of survey respondents rated both surface water quality and groundwater quality either excellent or good in southwestern Idaho.
- The surveyed public had definite views about the water quality of the three major rivers in the watershed. More than two-thirds of the respondents identified the Snake River as being dirtier than the Payette and Weiser rivers.
- On the whole, the respondents expressed moderate to good knowledge about the sources of water contamination.
- More than 42 percent of the survey respondents felt that crop production was the main cause of pollution in rivers in southwestern Idaho. Respondents born in Idaho were less likely to cite agriculture than non-natives (48.9 percent vs. 69.6 percent) as the major source of river pollution.
- Even though the general public felt that agriculture had an adverse impact on water quality, respondents did not feel that a majority of farmers used excessive amounts of water, pesticides, or fertilizers.
- Residents of southwestern Idaho are very concerned about water issues that affect health: clean drinking water and clean groundwater. The public also considers clean rivers and water quantity issues very important.
- The majority of the general public in southwestern Idaho receives its water information from three agencies: the Idaho Department of Water Resources (IDWR), local health districts, and Soil and Water Conservation Districts (SWCD).
- The majority of the survey respondents use both the newspaper and television as media sources of water quality information. Another 31.7 percent of the respondents indicated they have received information through Cooperative Extension System brochures. Less than 12 percent of respondents use magazines, radio, or computers as media sources of water quality information.
- More than 62 percent of the survey respondents felt that the HUA project would either have some impact or a great deal of impact on water quality in the watershed. Only 6.7 percent of the respondents felt that the HUA project would have no impact on water quality.

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About the authors

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