

REPORT

Deliberative Polling in Ghana: First Deliberative Poll in Tamale, Ghana

SUBMITTED: August 30, 2015

This publication was produced for review by the United States Agency for International Development. It was prepared by the Center for Deliberative Democracy at Stanford University and the Resilient Africa Network West Africa Resilience Innovation Lab at the University of Development Studies



The West Africa Resilience Innovation Lab (WA RILab), working in close collaboration with the Center for Deliberative Democracy (CDD) at Stanford University, conducted Ghana's first Deliberative Poll (DP) in January 2015. A random, representative sample of the Tamale Metropolitan Area was convened for a two-day deliberation in Tamale. The participants in Tamale deliberated face-to-face on January 10-11, 2015.



Map of Ghana

Background

Deliberative Pollingⁱ assesses the representative opinions of a population, both before and after it has had a good chance to really think about an issue and discuss it in depth. The idea is to gather a good sample and engage it in transparently good conditions for considering the pros and cons of competing policy options. Most citizens, most of the time, in most countries around the world, do not spend much effort considering public policy questions in depth. The premise of Deliberative Polling is that when policy options are important for a community, then public consultations about them should be representative of the population and thoughtfully based on the best information available. Therefore, there is a strong case for

engaging a good random sample through transparent and good conditions for considering the issues and arguments for and against various policy options.

The method offers certain advantages over other methods of public consultation. Self-selected town meetings are unlikely to be representative because they only involve those who feel strongly enough to attend. Focus groups cannot be used to represent opinion because they are too small to be statistically meaningful. Rather they are useful for uncovering the way the public frames an issue as a step in facilitating more systematic research. Conventional polls, while potentially representative when done well, offer the public's impression of sound bites and headlines. They do not reflect what the public would think if it were actually engaged in thinking about the issues. Deliberative Polling is a



Modern buildings in Tamale

method that offers representative and informed opinion. It offers a road map to the policies the public would accept, on reflection and for what reasons. It can also offer a guide to those the public would have reservations about, and for what reasons.

Problem and Justification

Tamale, the administrative and commercial capital of northern Ghana, is the country's third most-populated city with a population of 461,072 in 2010. The 26% increase in population

over the last decade outstripped the government's capacity to provide sufficient water resources, sanitation and hygiene infrastructure. Investments made by the government in recent years have been ineffective in improving the situation. As a result, Tamale residents suffer from a range of problems including disease and food insecurity. This Deliberative Poll was focused on two main categories of issues: Water, Sanitation and Hygiene (WASH); and Livelihood and Food Security. The purpose of the Deliberative Poll was to provide direction for the local government, as well as donor agencies, on how to address the most pressing needs faced by people in the metropolis.

In many countries, the policy process does not adequately involve the communities. Governments often use subjective assessments of situations to craft policies towards mitigation of risk and vulnerability. The challenge then is how to consult the communities and seek their opinion in an adequately representative and unbiased way. Deliberative Polling provides a method by which a representative sample of the community can be consulted in depth on key issues. It provides representative and informed opinion data, both quantitative and qualitative, about the views of the public once they have really considered the issues.

Participant Sample

A scientific random sample of the Tamale Metropolitan Area was gathered for two days of deliberation. The samples were recruited through random selection of households and random selection of participants within the households. In total, 243 persons were interviewed and only 2 persons selected declined to take the initial survey. 35 respondents completed the baseline survey but did not attend the deliberations. A total of 208 persons completed the actual two days of deliberations. Tables A and B in the Appendix show that there were very few significant differences between the participants and non-participants in either demographics or attitudes. The response rate was 85% a very high level by world standards for surveys and even more remarkable for two days of deliberation.



Interviewers in Tamale

The sample was 48% male with an average age of 33.7 years. 27.9% of the participants had never been to school.

3.9% were first degree holders. The project offers a good test case for the challenges of whether deliberative democracy can be applied in a development context with populations that have low educational levels. The results summarized below suggest a positive answer.



Deliberators during a plenary session

day of deliberation.

Opinion Changes

All of the policy proposals were rated before and after deliberation on the same 0 to 10 scale, where 0 is “extremely unimportant” and 10 is “extremely important” and 5 is exactly in the middle. In the Tamale Deliberative Poll, 28 of the 39 policy proposals (71.8 percent) showed statistically significant changes after deliberation.

The proposals were all rated highly before and after. All of them stayed on the “important” side of the scale. This is not surprising since they all focused on basic sanitation, health and food security issues for a population facing severe challenges in these areas.

Yet some of the proposals posed some hard choices. The briefings made clear that the public latrines and the areas for gardening were currently very much in the same places. On the map (see Figure 1 on the next page) they appeared to be in nearly identical locations. Given the scarcity of water, and the fragility of food security, it is not surprising that a great number of people survive by raising food in gardens using waste water. Hence a focus on food security would have its cost in the spread of diseases, especially cholera. But a focus on health would require sacrifices in food security. This tradeoff was explored in question 40:

An extensive advisory group of stakeholders, NGOs, academic experts and government officials developed and vetted the briefing discussion materials (see Appendix Table C for list). Their work built on previous focus groups and key informant interviews. The two days of discussion were divided as follows: Livelihood and Food Security on day one, then Water, Sanitation and Hygiene on day two. Given the low literacy rate of the population, a fifteen-minute video version of the briefings was produced and shown at the beginning of each



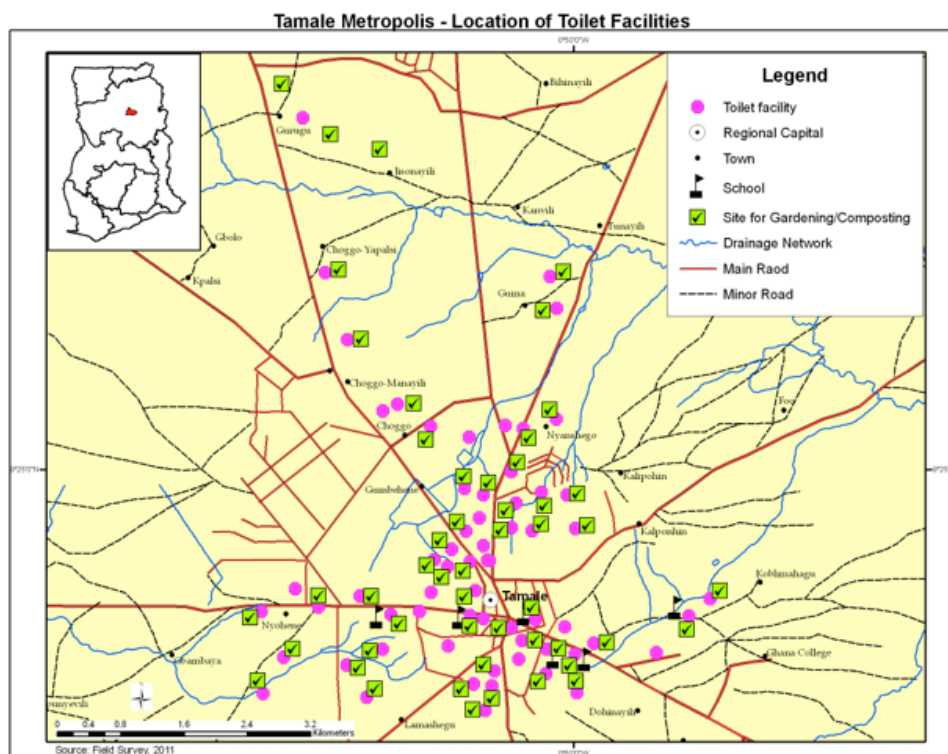
An interviewer meets with a participant prior to the event.

“Some people think that vegetable farms should produce as much as possible, even if they have to use the waste water from toilets (at point 0). Other people think that vegetables should only be produced with clean water, even if that means fewer vegetables are produced (at point 10).”

Before deliberation, the support was already strongly on the clean water side of the trade-off (at a mean of 9.04 on the ten point scale). After deliberation it moved even further to 9.53 on the scale, a gain of nearly half a point and a very significant change ($p=.0004$). Participants were significantly more willing to emphasize clean water to avoid disease even at the cost of food security.

This trade-off is also reflected in the policy option: “Ban the use of untreated waste water for gardening” an option that increased from 8.53 on the ten point scale to 9.09, an increase of more than half a point and a strongly significant change ($p=.0004$). This option shows the willingness to require a ban on the practice so it is not merely a prescription but a proposal for a legal requirement.

Figure 1. Map of Toilet Facilities in Tamale Metropolis



While deliberators were willing to ban waste water for gardening they were very interested in supporting other solutions for water that could support farming. For the proposal: “Promote a low cost treatment of waste water for farming through the use of charcoal and stones” the results showed an increase from 7.77 to 8.36 ($p=.0003$). And to conserve water, “promote the use of drip irrigation” an increase from 8.44 to 9.01 ($p=.0003$).

They were also interested in other sources of clean drinking water: “Provide water tanks for rain water harvesting in all educational institutions” increased from 8.85 to 9.35 ($p=.0000$). The same question for residential facilities increased from 8.80 to 9.20 ($p=.006$).

Some empirical premises shed light on the reasoning: “Providing water tanks for setting up rain water harvesting systems would ensure people availability for more good quality water” increased from 8.55 to 9.04 ($p=.007$). And, “treating waste water for farming would allow people to use good quality water for drinking” increased from 7.75 to 8.81, an increase of more than a full point 1.06 ($p=.000$).

It is important to realize that since these proposals are all on the *important* side of the scale, we are effectively using the range from 5 to 10. In this context a half point shift is a large one (a tenth of the whole effective range) and a shift of a full point is really large (20% of the effective range of the scale). So the increases are not only strongly significant, they are also large substantively.

All of the changes are shown in Table 1. Table 2 shows the top ten priorities after deliberation. Here the top three proposals show the public putting the highest priority on practical measures to control disease: “Promote public education for effective cholera control went up significantly from 9.45 to 9.71 ($p=.001$); and, “Implement a systematic plan to control mosquitoes” went up significantly from 9.09 to 9.52 ($p=.001$); and “intensify the hand washing campaign in schools” went up significantly from 9.25 to 9.51 ($p=.008$).

Other significant changes supported food security with training for backyard poultry farms, backyard gardens and appropriate storage facilities for farming. There was also strong support for food fairs to encourage consumption of local foods and training for better nutrition and promotion of fonio and other neglected nutritious crops.



Fonio grain

Efficacy and Expectations

Participants were asked before and after whether or not they thought anyone would make use of these results. Would the government take it seriously? Would it use the results? Would the community use the results? On all counts there were very significant increases in the expectation that they would. When asked, “How serious or not serious do you think the government will take into account your views and suggestions provided in this event?” participants’ views on government seriousness increased significantly from 6.90 to 7.93 more than a full point on the scale, $p=.000$. And, regarding how confident participants were

that the government would use the results from the Deliberative Poll, participants' confidence increased significantly from 6.59 to 7.92 (an even larger gain with $p=.000$). Lastly their confidence that the community would use the results increased significantly from 7.38 to 8.42, again an increase of more than a full point with $p=.000$. Regarding their own opinions on whether "I have opinions about my community worth listening to" there was a significant increase from 8.30 to 8.76 ($p=.023$).

These increases in external efficacy (whether the government or community will pay attention or respond to their opinions) and in internal efficacy (whether their opinions are worth listening to) are impressive results of the dialogue. They can be found in Table 1 questions 47-50. The deliberations seem to have had a considerable effect on their sense of efficacy.

Top Ten Proposals

There are two ways of looking at the quantitative results of the Deliberative Poll. First, one can look at how opinions change when people deliberate and really think about the issues. As noted earlier, the overwhelming majority of the policy proposals, 28 out of 39, changed significantly with deliberation. Second, one can look at the highest rated proposals at the end of the day, whether they changed or not. Before deliberation one might rate a proposal highly but one is unlikely to have thought about all the arguments for and against it in any depth. After a weekend of deliberation, a respondent has really considered the competing arguments. Hence if the proposal is still rated highly, it reflects a kind of considered judgment. It is an opinion that has been tested against the arguments on the other side. It is thus worth looking at the top proposals regardless of how much they changed.

Table 2 shows the top ten proposals after deliberation. All the policy options were rated on the same 0 to 10 scale, so it is easy to see which ones were the top choices after all the deliberations were concluded.

Eight of the top ten proposals reflect the high priority participants put on fighting disease, via better sanitation, hygiene and efforts to combat malaria. We saw earlier that when faced with the difficult choice between disease and food security, they opted for fighting disease, as with the support for banning untreated waste water for gardening even if it might endanger food security. The top proposals included: promoting education for effective cholera control, implementing a systematic plan to control mosquitoes, intensifying the hand washing campaign in schools, ensuring the regular desilting of gutters (which eliminates pools of water that can breed mosquitoes), promoting the use of environmentally friendly toilets, building the capacity of local institutions to promote good hygiene and sanitation practices and providing rain water harvesting for the schools.

Knowledge

Table 3 reports the results of the knowledge questions. The percentages indicate the percentage of correct answers on multiple choice questions. All five of the knowledge questions showed significant increases, as did the index for knowledge (constructed from the five questions which asked for participants' knowledge of facts pre- and post-deliberation.). The index increased significantly from 25.1% to 37.5% an increase of more

than 12 points ($p=.000$). Some of the gains were large. For example on which disease is the biggest killer in Ghana, 31% answered malaria correctly before deliberation and this increased to 46.5% after deliberation ($p=.000$). Before deliberation, only 21.6% knew that the percentage of Tamale with access to potable water daily was about 40%. After deliberation, the percentage correctly answering this question rose significantly to 37.6%, an increase of 16 points ($p=.000$). The deliberations show a representative microcosm that became more informed. The knowledge index will be used in later analyses of opinion change.

Event Evaluation

Table 4 summarizes participants' feelings about the event overall. Almost all participants (99.5%) reported that the Deliberative Poll event was a valuable use of their time, with 88% saying that it was extremely valuable. Further, all participants felt the briefing materials and the event as a whole were valuable; with 83% of participants indicating that the briefing materials were extremely valuable and 90% of participants indicating the event as a whole was extremely valuable. The participants also provided extremely positive feedback about the moderators who, according to the survey questions, were unbiased when leading discussions and effectively facilitated discussions for everyone to contribute his or her diverse views on the topic. All participants agreed that the group moderator provided everyone an opportunity to participate in the discussion, with 95% strongly agreeing. In addition, 90% of participants disagreed that the moderator tried to influence the group with his or her views, with 82% strongly disagreeing. In terms of participants' views of fellow participants, nearly all participants (99%) agreed that they learned a lot about people very different from them and 93% agreed with this statement strongly. These are among the strongest evaluations we have seen in Deliberative Polls around the world. Furthermore, they show the high level with which the model was implemented at least from the standpoint of the participants.

Small Group Discussions

The 208 deliberators were randomly assigned to 15 small groups led by trained moderators. These small groups deliberated in depth on the issues posed and formulated questions for the plenary sessions with competing experts. The moderators were trained to facilitate the discussion but not to offer any hint of their own positions on the issues. The process alternated these small group discussions with plenary sessions in which competing experts responded to questions agreed on in the small groups. All the small groups were taped and transcribed. Excerpts from the small group discussions shed light on the reasoning of participants in responding to the pros and cons of the various proposals. This qualitative data adds to the quantitative results discussed earlier and shown in Table 1. Table 5 shows excerpts from the small groups on a number of the policy proposals which increased significantly. We will summarize in what follows.

"Promote training for households and community groups to set up backyard poultry farms" increased from 8.11 to 8.93 a very significant increase at the .000 level (question 1 in Table 1). Participants saw the value of the poultry farms and expressed a need for the training. "We don't have the technical know-how about them (poultry), the diseases and the food they eat." And, "when one raises poultry you can get meat and egg which are essential

components of food. One can also save money because you do not need to go to the market and buy meat again.” There are also other uses: “[Even] their droppings however is very useful because lately our soils have lost all their fertility so if the droppings are carted they can be used to improve soil fertility.”

There was an even more significant increase in how respondents viewed the importance of “training for households and community groups to set up backyard gardens” (question 2 in Table 1, an increase from 7.14 to 8.34 significant at .000). A prime argument seems to have been that backyard gardens will be safer for raising vegetables. Participants noted that if people are raising their own food “they will always make sure the crops are clean for consumption so they will be healthy.” It was also noted that, “if you buy vegetables from the market you may not know if the vegetables have been watered and or washed with untreated wastewater or sprayed with chemicals.” In addition “you can sell some to give you income.”

The proposal: “Encourage a public-private partnership to convert waste to energy” increased significantly from 8.55 to 9.15 at the .000 level (question 17). Participants realized that both disposal of waste and lack of energy were problems. The waste to energy strategy could make one problem part of the solution to the other. “If they can do it so that it can be turned in to fire for cooking or electricity it would have been nice because if you observe, there are lots of toilets in Tamale.” Disposal is a problem: “you can see a toilet with filled holes and they claim there is no lorry to convey it. And even if it is conveyed the place to go and dump it is a problem.” Other participants noted that recycling might provide jobs and the process might provide income for the city.

Next, the proposal to “provide water tanks for setting up rain water harvesting in all educational institutions” increased significantly from 8.85 to 9.35 at the .000 level (question 5). In the small groups comments focused on how such water tanks would keep children in school and save money, “most of the children during break would ask that they want to drink water and they usually do not return.” Also, sometimes “the students have to use our chop money to buy water for our daily use.” There were also concerns expressed about “the maintenance of those facilities and how good and hygienic the water will be.” But even then the water “can be used for handwashing and for the cleaning of the urinary and toilets.”

The proposal: “Promote food fairs to encourage the consumption of local foods” rose from 8.05 to 8.65 a significant increase at the .001 level (question 14 in Table 1). Participants reasoned that “it is from our local foods that we get a lot of nutrition, the *koose*, the vegetables and all.” There were favorable comments on the annual Farmers Day focused on “Eat What You Grow” and the suggestion that “the assembly should get experts in diet so they can go round and educate people on the nutritional value of the foods we cultivate.”

Another proposal: “Promote the use of environmentally friendly toilets in all houses” rose from 9.27 to 9.48 a significant increase at the .05 level (question 23 in Table 1). The participants supported the idea that “all houses should have toilets because you can pick up diseases from the public toilets.” But this is hard with limited resources. One person noted:

“Sometimes we don’t have water to drink, not to talk of use them on flushing toilets.” This may be a factor in favor of the environmentally friendly toilets which are better for water usage.

Lastly, the proposal: “Promote a low cost treatment of waste water for farming through the use of charcoal and stones” rose from 7.77 to 8.36, a significant increase at the .003 level (question 29). While there was some skepticism expressed as to whether this would happen, the participants were well aware of the benefits: “if they do it and we use the treated water to water the vegetable it will prevent us from acquiring diseases.” While the water will not be good enough for drinking it will likely be more healthy for farming: “so we should drink the pipe water and treat the waste water for farming.” There are however practical issues “if you do it with charcoal and harvest the top cleaned water what will you do with the down dirty water? Are you going to pour it away or you will have another means of treating it again.”

Conclusion

The premise of this deliberative consultation is that the people who must live with the policies should have a voice. That voice should be representative of the whole population and it should take place under conditions where people can think about the issues in depth, get their questions answered by experts and policy makers who represent different points of view and then people can offer their views in secret ballots or confidential questionnaires so the process can collect their sincere opinions shielded from social pressures to agree with everyone else.

By all social science standards, these goals were met. The sample was representative, the participants changed their views in many statistically significant ways, they did so for identifiable reasons, they became demonstrably more informed, they increased their sense of efficacy as citizens, and they identified specific policy solutions that can help address Tamale’s urgent problems.

A select group of expert stakeholders, most of them having been part of the Tamale DP process from the start, has subjected these findings to further analysis. They examined the proposals that received the strongest support and assessed them based on their level of practical implementation, using criteria including cost, impact potential, implications for use of indigenous knowledge, gender sensitivity, and cross cutting ability to address diverse challenges facing rapidly urbanizing cities. This process has also been supplemented by qualitative analysis based on the transcripts of the small group discussions and the plenary sessions during the deliberations.

The working group, in consultation with the DP Advisory Group (see Appendix Table C), plans to produce policy briefs to yield specific strategies of implementation in response to this systematic public consultation.

Table 1: Opinion Changes
Tamale Deliberative Poll - Pre and Post Deliberation

Note: All questions are on a 0 to 10 scale, where 0 is extremely unimportant and 10 is extremely important.

Question	T1	T2	T2-T1	Sig.
1. Promote training for households and community groups to set up backyard poultry farms	8.11	8.93	0.82	0.000***
2. Promote training for households and community groups to set up backyard gardens	7.14	8.34	1.20	0.000***
3. Promote access to information on credit opportunities for livelihood activities	7.57	8.26	0.69	0.002***
4. Promote the setting up of village savings and loans associations	7.80	7.99	0.19	0.392
5. Provide water tanks for setting up rain water harvesting systems in all educational institutions	8.85	9.35	0.50	0.000***
6. Promote access to credit for urban farmers through the Common Fund	7.89	8.46	0.57	0.005***
7. Provide timely weather forecasting information for farming	8.55	8.79	0.24	0.114
8. Provide timely extension services for farming	8.82	9.04	0.22	0.094
9. Provide appropriate storage facilities for farming	8.71	9.20	0.49	0.000***
10. Provide technology training for food storage	8.64	9.25	0.61	0.000***
11. Promote maximum use of local foods	8.82	9.33	0.51	0.000***
12. Train people to prepare nutritious foods using local food items (millet, groundnuts)	8.61	9.10	0.49	0.000***
13. Promote the cultivation of fonio and other neglected nutritious local crops	8.05	9.02	0.97	0.000***
14. Promote food fairs to encourage the consumption of local foods	8.08	8.65	0.57	0.001***
15. Promote the setting up of a mobile phone platform for providing information to farmers	7.71	7.65	-0.06	0.750
16. Set up sewage treatment plants for managing solid and liquid waste	8.69	9.19	0.50	0.001***
17. Encourage a Public-Private-Partnership to convert waste to energy	8.55	9.15	0.60	0.000***
18. Ban the use of plastic carrier bags in the city	6.79	7.64	0.85	0.001***
19. Promote the use of carrier bags made of biodegradable materials	8.14	8.97	0.83	0.000***
20. Encourage media houses to allocate weekly airtime for water, hygiene and sanitation information	8.90	9.16	0.26	0.042**
21. Promote the segregation of household waste by providing waste bins	8.46	8.65	0.19	0.328
22. Promote the sorting of waste by all institutions	8.58	8.86	0.28	0.091
23. Promote the use of environmentally-friendly toilets in all houses	9.27	9.48	0.21	0.052**
24. Promote the use of environmentally-friendly toilets in all institutions	9.24	9.44	0.20	0.059
24b. Ban the setting up of vegetable farms within 100m of toilet facilities	8.62	8.80	0.18	0.358
25. Ban the use of untreated waste water for gardening	8.53	9.09	0.56	0.004***
26. Intensify the behavior change communication campaign to improve hygiene and sanitation	8.86	9.18	0.32	0.017**
27. Intensify the hand washing campaign in schools	9.26	9.51	0.25	0.008***
28. Build the capacity of local institutions such as the School of Hygiene to promote good hygiene and sanitation practices	8.97	9.35	0.38	0.001***
29. Promote a low cost treatment of waste water for farming through the use of charcoal and stones	7.77	8.36	0.59	0.003***
30. Promote the use of drip irrigation	8.44	9.01	0.57	0.001***
31. Encourage communities to use organic materials in agriculture such	8.79	9.39	0.60	0.000***

as composting				
32. Promote the setting up of irrigation facilities adapted for urban settings such as using boreholes, wells and dugouts	8.58	8.88	0.30	0.069
33. Provide water tanks for setting up rain water harvesting systems in residential facilities	8.80	9.20	0.40	0.006***
34. Ensure regular desilting of gutters	9.24	9.51	0.27	0.005***
35. Construct and maintain gutters	9.23	9.32	0.09	0.378
36. Provide more opportunities for the most vulnerable to buy insect treated bed nets at a low price	8.89	9.11	0.22	0.097
37. Implement a systematic plan to control mosquitoes	9.09	9.52	0.43	0.001***
38. Provide the most vulnerable with treated bed nets at a low price	8.85	9.14	0.29	0.109
39. Promote public education for effective cholera control	9.46	9.71	0.25	0.001***
40. Some people think that vegetable farms should produce as much as possible, even if they have to use the waste water from the toilets (at point 0). Other people think that vegetables should only be produced with clean water, even if that means that many fewer vegetables are produced (at point 10).	9.04	9.53	0.49	0.004***
41. How strongly would you agree or disagree with the following statements? 0 is strongly disagree, 10 is strongly agree and 5 is exactly in the middle.				
41a. Providing water tanks for setting up rain water harvesting systems would ensure people availability of more good quality water	8.55	9.04	0.49	0.007***
41b. Treating waste water for farming would allow people to use good quality water for drinking	7.75	8.81	1.06	0.000***
41c. Sewage treatment plants would prevent fecal and solid waste ending up in the wrong places.	8.61	9.00	0.39	0.009***
41d. Teaching people how to prepare nutritious meals would solve food contamination.	8.11	8.92	0.81	0.000***
41e. The media promotions on sanitation and hygiene will not change people's behavior.	4.22	4.41	0.19	0.573
41f. Getting more access to loans and credit will improve our daily lives.	7.17	7.63	0.46	0.047**
47. On a 0 to 10 scale, where 0 is not at all serious, 10 is completely serious, and 5 is exactly in the middle, how serious or not serious do you think the government will take into account your views and suggestions provided in this event?	6.90	7.93	1.03	0.000***
48. On a 0 to 10 scale, where 0 is not at all confident, 10 is completely confident, and 5 is exactly in the middle, how confident are you the government will use the results from this event?	6.59	7.92	1.33	0.000***
49. On a 0 to 10 scale, where 0 is not at all confident, 10 is completely confident, and 5 is exactly in the middle, how confident are you the community will use the results from this event?	7.38	8.42	1.04	0.000***
50. And, how strongly would you agree or disagree with the following statements? 0 is strongly disagree, 10 is strongly agree, and 5 is exactly in the middle.				
50a. "Most people do not know much about public affairs, decision making is best left to experts, community leaders and government officials."	7.70	7.94	0.24	0.410
50b. "I have opinions about my community that are worth listening to."	8.30	8.76	0.46	0.023**

Table 2: Top Ten Proposals After Deliberation
Tamale Deliberative Poll - Pre and Post Deliberation

Note: All questions are on a 0 to 10 scale, where 0 is extremely unimportant and 10 is extremely important.

Question	Pre	Post	Post-Pre	Sig.
39. Promote public education for effective cholera control	9.46	9.71	0.25	0.001***
37. Implement a systematic plan to control mosquitoes	9.09	9.52	0.43	0.001***
27. Intensify the hand washing campaign in schools	9.26	9.51	0.25	0.008***
34. Ensure regular desilting of gutters	9.24	9.51	0.27	0.005***
23. Promote the use of environmentally-friendly toilets in all houses	9.27	9.48	0.21	0.052**
24. Promote the use of environmentally-friendly toilets in all institutions	9.24	9.48	0.20	0.059
31. Encourage communities to use organic materials in agriculture such as composting	8.79	9.39	0.60	0.000***
28. Build the capacity of local institutions such as the School of Hygiene to promote good hygiene and sanitation practices	8.97	9.35	0.38	0.001***
5. Provide water tanks for setting up rain water harvesting systems in all educational institutions	8.85	9.35	0.50	0.000***
11. Promote maximum use of local foods	8.82	9.33	0.51	0.000***

Table 3: Tamale Knowledge Changes – Pre and Post Deliberation

Note: The table shows gains in knowledge after deliberation. The index in the last row shows the overall gains for the five questions.

Question (% correct)	T1	T2	T2-T1	Sig.
Q42. Which of the following is true about Tamale? ANSWER: E. Tamale has a higher percentage of people who are not working than any other city in Ghana.	24.1	33.5	9.4	0.018**
Q43. Which of the following diseases is the biggest killer in Ghana? ANSWER: C. Malaria	31.0	46.5	15.5	0.000***
Q44. How much more densely populated is Tamale compared to the Region? ANSWER: D. about twelve times	8.6	24.5	15.9	0.000***
Q45. Which percentage of Tamale has access to potable water daily? ANSWER: B. about 40%	21.6	37.6	16.0	0.000***
Q46. Which of the following statements is TRUE? ANSWER: C. About 20% of the population use open drains, private toilets with fee, and/or open defecation.	40.0	45.3	5.3	0.205
Index	25.1	37.5	12.4	0.000***

Table 4: Tamale Post Deliberation – Event Evaluations

Question	% Valuable	% Extremely Valuable
On a scale of 0 to 10, where 0 is "a waste of time", 10 is "extremely valuable" and 5 is exactly in the middle, how valuable was each of the following in helping you clarify your positions on the issues?		
The small group discussions	99.5	87.7
The briefing materials	100.0	83.0
The plenary session	99.5	76.3
Event as a whole	100.0	90.1
And how strongly would you agree or disagree with each of the following statements?	% Agree	% Strongly Agree
My group moderator provided the opportunity for everyone to participate in the discussion	100.0	95.3
The members of my group participated relatively equally in the discussions	96.2	78.8
My group moderator tried to make sure that opposing arguments were considered	80.8	68.3
The important aspects of the issues were covered in the group discussions	97.2	84.4
I learned a lot about people very different from me - about what they and their lives are like	98.6	92.5
	% Disagree	% Strongly Disagree
My group moderator sometimes tried to influence the group with his or her own views	90.1	82.0

Table 5

Excerpts from the Small Group Discussions

SET UP BACKYARD POULTRY FARMS AND VEGETABLE FARMS

Problem Summary: Rapid urbanization means less land for farming as agricultural lands have been converted to residential facilities. There is the need to make use of available land for diversified livelihoods, food security and improved sanitation. Achieving this will involve training and credit facilities for households and community groups.

Backyard Poultry farms

“This is a good idea because I don’t have land to grow maize and other food crops but I can get a small piece of land to set up a place to rear goats and sheep among others. The issue here is the capital to invest. This is where this concept comes in handy so that the men and other people who don’t have jobs can take advantage of the intervention and engage themselves”.

“If that is done the importation of poultry into Tamale will reduce. This will also support you to cater for your children and other dependents. You can buy maize from it and a whole lot. After raining season there no work to be done. So, if we do well to engage ourselves in the rearing of poultry it will help us. If we sell our farm produce to pay school fees and reserve some for the consumption of the family, the poultry can supplement the proceeds from our farms to such a period when we will be engaged in the farms”.

“It will be a laudable idea if the assembly can help train people from our household about the poultry farming. I think it will enable us to get, create some sort of jobs in our homes, even though we do it already but we don’t have the technical know-how about them, the diseases, and the kind of food they eat. So if they do it, it will reduce the importation of poultry into the country. Some kind of meat that is not good to our consumption and I think it will create some kind of jobs for us, because they will need personnel to do certain things during the education. So it will help us a lot. have also seen that the backyard poultry farm is very important. This is because each of us here will like to chew meat when eating and also to have eggs on our food. When one raises poultry, you can get meat and egg, which are essential components of food. One can also save money because you do not need to go to the market and buy meat again. You can also get money from the sales of the animals. This will also bring you a lot of friends because if they visit you and you give them some of the animals or their eggs, the fellow will never forget of you”.

“Their dropping however is very useful because lately our soils have lost all their fertility so if the droppings are carted they can be used to help improve soil fertility”.

Backyard Vegetable farms

“It is important because when they teach people how to do backyard farming it will help them to get good food to eat. They will take very good care of the plant since they are the people to eat. They will always make sure the crops are clean for consumptions so they will be healthy”.

“I agree that they should encourage backyard vegetables farms. If you buy vegetables from the market you may not know if the vegetables have been watered and or washed with untreated wastewater or sprayed with chemicals. But when you grow these in your own backyard garden, you will take good care of them such that you always have good and fresh vegetables to enjoy”.

“When you cultivate your tomatoes and other vegetables you cannot eat all at the house hold level so at least you can sell some to give you income”.

“It is a laudable idea. During the Acheampong regime (in the 1970s) there was a programme called “Operation Feed Yourself”. People farmed by their houses to feed themselves”.

“If they promote the backyard farming at least for home consumption is better than going out to buy from sources that you don’t know what water has been used. Some people use untreated wastewater and others apply chemicals to their vegetables which is not good for our health. This is good because parents will be able to save money”.

SET UP RAIN WATER HARVESTING SYSTEMS IN EDUCATIONAL INSTITUTIONS

Problem Summary: Tamale has a very low later table, which makes the area unsuitable for borehole drilling. Educational institutions are particularly disadvantaged because frequent water shortages affect school enrolment, attendance, completion and achievement.

“It would help because most of the children during break would ask that they want to drink water and they usually do not return. So if the storage facilities are done then it would help keep the children in school and also enhance teaching and learning”.

“The provision of the tanks in the schools will be very important. Sometimes we the students have to use our chop money to buy water for our daily use”.

“I think that will have been a laudable idea and I believe is already in the system example around my house there is a school there and I have seen it there. But my problem is the maintenance of those facilities and how good and hygienic the water will be. If the water is treated it can be used for hand washing and for the cleaning of the urinary and toilets”.

PROMOTE MAXIMUM USE OF LOCAL FOODS

Problem Summary: This involves promoting the cultivation of fonio and other neglected nutritious local crops; providing facilities and technology training for food storage: training people to prepare nutritious foods using local food items (millet, groundnuts); and organizing food bazzars/fairs to encourage the production and consumption of local foods

“As we speak, everybody wants to be healthy and it is from our local foods that we get a lot of nutrition, the *koose*, the vegetables and all”.

“Our local foods are more nutritious than the foreign foods”.

“I think is good, when you look at the annual FARMERS DAY this year (2014), the theme for the celebration was **Eat What You Grow**. For instance, rice, maize, beans, etc are all what we farm but government still sends money to buy food outside the country and the money they use will have been used to farm those foods and even take good care of them. So it is time for us to also start using what we have”.

“The assembly should get experts in diet so that they can go round and educate people on the nutritional value of the foods we cultivate. This education will make us patronize the local foods. Food expert should educate us on how nutritious eating rice and dawadawa is rather than allowing us to eat the fried rice which has nothing important for our health”.

ENCOURAGE A PUBLIC-PRIVATE-PARTNERSHIP TO CONVERT WASTE TO ENERGY

Problem Summary: Waste goes waste whereas it is a rich resource. Private companies can support the government to turn waste into energy in innovative ways that solve many problems at the same time. This will involve providing waste bins to households and institutions to encourage the sorting of waste.

“I have agreed to that because the government is choked with a lot of work, so if the Assembly encourages private companies to help the government it will be something good and also it will create employment for the unemployed”.

“It is good to propose such things, because in Tamale here most of us are farmers, we work in only raining season, so this recycling can give most of us employment, and the refuse containers in our areas, we can assign it to youths in our area, so that if someone comes to deposit refuse he will pay money. Example in Accra they do that, it will reduce poverty in our country”.

“I think is good idea for the assembly to collaborate with the private companies to turn waste to energy. It will reduce load shedding in the country because as it provides light it will also provide income to the assembly as well”.

“If they can do it so that it can be turned in to fire for cooking or electricity it would have been nice because if you observe there are lots of toilets in Tamale. You can see a toilet with filled holes and they claim there is no lorry to convey it. And even if is conveyed the place to go and dump it is a problem because wherever they are going to pour it away is somebody else place when it rains it will carry it in to water and humans will drink it again”.

“It is true that partnership is good because the government cannot do everything for us so he needs support from these individuals”.

PROMOTE THE USE OF ENVIRONMENTALLY-FRIENDLY TOILETS

Problem Summary: Liquid waste disposal is a problem for rapidly urbanizing communities. Provision of environmentally friendly toilets with biogas potential will serve the purposes of both residential facilities and especially educational institutions.

“It is good to have good toilets but I don’t think we can build them. Sometimes we don’t have water to drink not to talk of use them on flushing toilets”.

“I think as for the toilets if the assembly could help us with education and it do not become necessary they give us money to build that would have been nice. Because if you look not even diarrhea you can be lying and it would get to a time and you feel the urge to defecate once you feel that urge where are you going to pass it? There are certain places you go to you will see toilet structures but no one uses it or see a toilet and when you go there is wood they have filled inside it so if assembly could have helped with education and not necessarily giving out money to build toilets but just to educate us”.

“All houses should have toilets because you can pick up diseases from the public toilets. People should be made to know that toilet is a necessary component in building a house. I agree that it is good for every house to have a toilet but there are certain houses that genuinely do not have resources to build such toilets”.

TREATMENT OF WASTE WATER FOR FARMING THROUGH THE USE OF CHARCOAL AND STONES

Problem Summary: Farming is still widely practiced and largely the mainstay of residents of the cities especially Tamale. Tamale for instance lacks clean drinking water, which means water for agricultural purposes, is hard to come by. Often, people who farm vegetables rely on untreated wastewater, which has health implications for consumers. There is the need to promote the multiple uses of water, which includes using traditional and low cost means of treating wastewater and using it for farming.

“If they come out with this proposal its good, but my problem is, they will say it without doing it. But if they do it and we use the treated water to water the vegetable it will prevent us from acquiring diseases”.

“I have agreed to that because, they use stones, charcoal and sea-sand to treat waste water. So it’s a process they follow to treat the water, the water will pass through the stones and charcoal before it comes out all the dirt in the water comes out and the water will be clean. So we should drink the pipe water and treat the waste water for farming”.

“Like I said the other time treating the water for farming will be good, instead of banning it”.

“If you look at the treatment using charcoal and stones, if they should teach us how to make safe water abundant I think it will be better than using the stones or charcoal because if you do it with charcoal and harvest the top cleaned water what will you do with the down dirty water are you going to pour it away or you will have another means of treating it again. So I think they should rather. Doing it will involve a lot of finance because it will require poly tanks and if possible get pipes to connect it to the source. Find us means of getting safe water”.

Appendix

Appendix Table A. Tamale Representativeness – Demographics

Note: Based on the demographic data available, the table shows the representatives of the participants that attended the Deliberative Polling event and those who completed an interview but did not attend the event or non-participants.

	Participants (%) (n=208)	Non-Participants (%) (n=35)	Sig.
Gender			
Male	47.6	38.2	0.312
Age	33.7	31.2	0.337
Martial Status			
Married	60.6	60.0	0.949
Single	35.1	34.3	0.926
Divorced	1.9	0.0	0.410
Widowed	2.4	2.9	0.874
Education			0.148
Never been to school	27.9	23.5	
Been to primary school	10.1	5.9	
Junior High School Leaver	14.4	11.8	
Senior High School Leaver	19.7	23.5	
Middle School Leaver	3.4	0.0	
Training College/Polytechnic graduate	18.8	17.7	
First degree Holder	3.9	14.7	
Second degree and above	0.5	0.0	
Other	1.4	2.9	
Occupation			
Farmer	10.1	0.0	0.050*
Employee in private business	8.2	5.7	0.618
Trade (business owner)	33.2	40.0	0.433
Trained teacher	7.2	8.6	0.777
Public servant	5.8	17.1	0.017**
Other	35.1	25.7	0.279
No. of children	2.4	1.7	0.126

Appendix Table B. Attitudinal Representativeness

Note: The table shows the attitudinal representatives of the participants that attended the Deliberative Polling event and those who completed an interview but did not attend the event or non-participants.

Question	Participants (n=208)	Non-Participants (n=35)	Sig.
1. Promote training for households and community groups to set up backyard poultry farms	8.12	7.55	0.188
2. Promote training for households and community groups to set up backyard gardens	7.15	7.21	0.917

3.Promote access to information on credit opportunities for livelihood activities	7.58	7.59	0.987
4 Promote the setting up of village savings and loans associations	7.81	7.15	0.483
5. Provide water tanks for setting up rain water harvesting systems in all educational institutions	8.86	8.74	0.733
6.Promote access to credit for urban farmers through the Common Fund	7.90	7.91	0.987
7. Provide timely weather forecasting information for farming	8.56	8.03	0.153
8. Provide timely extension services for farming	8.84	8.41	0.184
9. Provide appropriate storage facilities for farming	8.72	8.82	0.754
10. Provide technology training for food storage	8.65	8.65	0.995
11. Promote maximum use of local foods	8.84	9.00	0.631
12. Train people to prepare nutritious foods using local food items (millet, groundnuts)	8.63	8.12	0.130
13. Promote the cultivation of fonio and other neglected nutritious local crops	8.06	8.06	0.998
14. Promote food fairs to encourage the consumption of local foods	8.11	7.29	.045**
15. Promote the setting up of a mobile phone platform for providing information to farmers	7.72	6.59	.010***
16. Set up sewage treatment plants for managing solid and liquid waste	8.70	9.09	0.261
17. Encourage a Public-Private-Partnership to convert waste to energy	8.52	8.52	0.992
18. Ban the use of plastic carrier bags in the city	6.78	6.35	0.476
19. Promote the use of carrier bags made of biodegradable materials	8.13	8.88	0.094
20. Encourage media houses to allocate weekly airtime for water, hygiene and sanitation information	8.90	8.94	0.890
21. Promote the segregation of household waste by providing waste bins	8.46	8.32	0.727
22. Promote the sorting of waste by all institutions	8.57	7.98	0.084
23. Promote the use of environmentally-friendly toilets in all houses	9.27	8.59	0.011***
24. Promote the use of environmentally-friendly toilets in all institutions	9.24	8.74	.047*
24b. Ban the setting up of vegetable farms within 100m of toilet facilities	8.61	7.94	0.163
25. Ban the use of untreated waste water for gardening	8.50	7.79	0.148

26. Intensify the behaviour change communication campaign to improve hygiene and sanitation	8.86	9.00	0.636
27. Intensify the hand washing campaign in schools	9.26	9.50	0.286
28. Build the capacity of local institutions such as the School of Hygiene to promote good hygiene and sanitation practices	8.96	9.00	0.893
29. Promote a low cost treatment of waste water for farming through the use of charcoal and stones	7.79	7.28	0.281
30. Promote the use of drip irrigation	8.44	8.75	0.422
31. Encourage communities to use organic materials in agriculture such as composting	8.78	8.65	0.680
32. Promote the setting up of irrigation facilities adapted for urban settings such as using boreholes, wells and dugouts	8.57	8.82	0.465
33. Provide water tanks for setting up rain water harvesting systems in residential facilities	8.80	8.47	0.371
34. Ensure regular desilting of gutters	9.23	9.41	0.427
35. Construct and maintain gutters	9.21	9.32	0.637
36. Provide more opportunities for the most vulnerable to buy insect treated bed nets at a low price	8.88	8.76	0.730
37. Implement a systematic plan to control mosquitoes	9.08	9.26	0.547
38. Provide the most vulnerable with treated bed nets at a low price	8.83	8.74	0.815
39. Promote public education for effective cholera control	9.46	9.50	0.814
40. Some people think that vegetable farms should produce as much as possible, even if they have to use the waste water from the toilets (at point 0). Other people think that vegetables should only be produced with clean water, even if that means that many fewer vegetables are produced (at point 10).	9.06	9.50	0.260

Appendix Table C. Members of the DP Advisory Group

NAME	ORGANISATION	DESIGNATION	EMAIL
Richard Kamboota	Institute of Local Government Studies	Director	rkamboota@yahoo.com
Prof. S. Alhassan	Institute of Continuous Education & Interdisciplinary Research	Director	zodaseidu@yahoo.com
Hon. Alhaji. A.A. Mohammed	Tamale Metropolitan Assembly	Presiding Member	Paamohammed2002@yahoo.com
Alima Sagito Saeed	Savannah Integrated Rural Development Aid	Executive Director	alima.sagito@sirdaghana.org
Mr. Raymond Wekem Avitim	Send Ghana	Director in charge of the Livelihood Security Programme	raymong@sendwestafrica.org
Prof. Jim Fishkin	CDD, Stanford University	Director	jfishkin@stanford.edu
Dr. Joseph Amikuzuno	Department of Climate Change and Food Security, UDS	Head of Department	amikj26@yahoo.com
Dr. George A Agulijam	ACED	Advisor	agulijam99@hotmail.com
Prof. Gordanna K B	University for Development Studies	International Relations	novagordanak@gmail.com
Dennis Chirawurah	West Africa RILab, SMHS, UDS	Director	afeyire@gmail.com
Dr. Emmanuel Abeere-Inga	Savannah Accelerated Development Authority	Director	abeereinga@hotmail.com

ⁱ Deliberative Polling® is a registered trademark of James S. Fishkin. The trademark is for quality control and benefits the Stanford Center for Deliberative Democracy.