

Community and academia partnerships: A description of the Lower Mississippi Delta Nutrition Intervention Research Initiative Project

Murugi Ndirangu, PhD^{*1}, Kathy Yadrick,
PhD², Susan Graham-Kresge, MPH³, Brent
Hales, PhD⁴, Amanda Avis, MPH⁵ and
Margaret Bogle, PhD, RD⁶

¹Division of Nutrition, Georgia State University,
Atlanta, Georgia, ²Department of Nutrition and Food
Systems, University of Southern Mississippi,
Hattiesburg, Mississippi, ³Department of Community
Health Sciences, University of Southern Mississippi,
Hattiesburg, Mississippi, ⁴Department of Economic and
Workforce Develop, University of Southern Mississippi,
Hattiesburg, Mississippi, ⁵Mississippi Department of
Education, Jackson, Mississippi and ⁶Delta Obesity
Prevention Research Unit, United States Department of
Agriculture, Little Rock, Arkansas, United States of
America

Abstract

The Lower Mississippi Delta (LMD) region of Arkansas, Louisiana, and Mississippi is among the poorest and most disadvantaged areas of the United States. The diets of the people in the LMD are high in fat, and consumption of fruits and vegetables is low. Chronic conditions such as hypertension, cardiovascular disease, obesity, diabetes, and cancer rates are high. In 1995, Congress through the USDA's Agriculture Research Services funded the multiyear Lower MS Delta Nutrition Intervention Research Initiative (Delta NIRI) project. The Delta NIRI project was a consortium of seven institutions of higher education and research from Arkansas, Louisiana, and Mississippi, and the Agricultural Research Services (ARS) of the United States Department of Agriculture (USDA). The primary goals of the Delta NIRI project was to evaluate nutrition and health status in the LMD and to design, implement, and scientifically evaluate nutrition interventions using community participatory methodologies. In this paper, we describe the functioning of the Lower Mississippi Delta NIRI project community-academia partnerships. We also discuss the structures used to gain community participation to address nutrition issues.

Keywords: Community Based Participatory Research (CBPR), Community-academia partnerships, community participation, nutrition interventions.

Introduction

Community based participatory research is defined as a systematic inquiry that features active participation of those affected by the issue being studied, for the purposes of education, taking action or affecting social change (1). The active engagement of communities in finding solutions to their problems, or community participation, was first applied to health programs in the early 1970s, mostly in developing countries. This was due to the realization that the

* Correspondence: Murugi Ndirangu, PhD, Division of Nutrition, College of Health and Human Sciences Georgia State University, POBox 3995, Atlanta GA 30302-3995, United States. Tel: 404-413-1233; Fax: 404-413-1228; E-mail: nadmn@langate.gsu.edu

basic health needs in these countries could be achieved only through greater involvement of local people (2). Community participation was a major component of the World Health Organization Primary Health Care Initiative signed in Alma Ata in 1978 (3), and the 1986 Ottawa Charter for Health Promotion (4). Communities have hence progressively become the center of locus of health promotion and behavior change (5).

Community-based interventions facilitate participation by the community through the formation of collaborations that draw their membership from different levels, sectors and individuals in the community. These ecological levels of a community are also the targets of interventions. Multisectoral collaborations have been used to address issues such as nutrition (6) and obesity interventions (7).

A new dimension to the formalization of community participation in public health interventions is that universities and other academic bodies are increasingly collaborating with community members in designing research interventions to address health problems. Community participation makes it possible for local individuals and agencies to be part of a governance structure that plans the deployment of resources (8-10). Community members are engaged in activities such as conceptualizing research questions, data collection, analysis, and dissemination of the results and follow-up on the actions taken (11). The participatory approach presumes to empower community members, create ownership, strengthen the capacity of members, and increase sustainability (8,12). The functioning of community-academia partnerships is usually guided by a steering committee (8) responsible for managing the activities of the partnership and balancing interests to minimize alternative agendas. The committees are typically composed of representatives from community groups, agencies, and academic institutions. Participation in such committees allows community members to take active roles in defining, analyzing, and acting on issues that concern them, thereby promoting empowerment at the individual, organizational, and community levels. Participation enhances attainment of skills, resources, knowledge, competencies, and efficacy (13).

Theories have been advanced for explaining why people participate in voluntary activities. The Social

exchange theory proposes that individuals' perspectives on the benefits and costs of participation will influence the decision to participate. Participation will only occur if the benefits are valuable to the participants and outweigh the costs (14). Benefits could be material, solidarity from social interaction, or purposive, which are more generalized such as improvements to the wider community. The costs of participation follow a similar typology, which includes material or personal costs such as time and money; solidarity costs such as personal conflicts; and purposive and organizational costs such as disagreement with planned activities (15). The most active participants report more benefits and lower costs do than less active participants (16).

Background

The Lower Mississippi Delta (LMD) region of Arkansas, Louisiana, and Mississippi is among the poorest and most disadvantaged areas of the United States (US). Rates of unemployment, families with income below the poverty level, infant mortality, low birth weight infants, and births to teen mothers are among the nation's highest (17). Hypertension, cardiovascular disease, obesity, diabetes, and cancer rates are also high. The diets of the people in the LMD are high in fat, and consumption of fruits and vegetables is low (18, 19).

In the early 1990s various stakeholders recognized need for large-scale, multi-faceted nutrition interventions to address nutrition issues in this region. Congress, through the USDA's Agriculture Research Services, responded to this need by funding the multiyear Lower MS Delta Nutrition Intervention Research Initiative (Delta NIRI) project in 1995. The Delta NIRI project was a consortium of the Agricultural Research Services (ARS) of the United States Department of Agriculture (USDA) and seven institutions of higher education and research from Arkansas, Louisiana, and Mississippi, including, Pennington Biomedical Research Center, Southern University and AandM College, Arkansas Children's Hospital Research Institute, University of Arkansas at Pine Bluff, University of Arkansas for Medical Sciences School of Public Health, Alcorn State University, and the University of Southern

Mississippi. The primary goals of the Delta NIRI project were to evaluate nutrition and health status in the LMD, and to design, implement, and scientifically evaluate nutrition interventions using community participatory methodologies.

The historical chronology of community entry has been reported elsewhere (10). The Delta project evolved through a number of phases with the active participation of community members. In the first phase, baseline data were collected in 36 selected counties and parishes in the LMD to understand the health needs and benefits to be achieved through nutrition interventions (19). In 2001, comprehensive nutrition interventions based on community-based participatory research (CBPR) methodologies were developed and implemented in the states of Louisiana, Mississippi, and Arkansas. Through a consultative process, local community leadership, community members and university representatives decided to start nutrition interventions in one community in each state. Partnerships were formed between community members and university and USDA-ARS representatives to oversee the planning, implementation, and evaluation of nutrition and health interventions.

In this paper we describe the Lower Mississippi Delta Nutrition Intervention Research Initiative (Delta NIRI) community-academia partnerships formed to address nutrition and health issues in this region. The structures used to gain community participation in the partnerships are discussed.

Methods

An embedded multiple case study methodology (20) was used to examine the Delta NIRI partnerships structures and community members' participation. Two types of data collection and analysis methods were used. First, a review of documents related to the Delta project was conducted to gain a historical perspective of the project as well as an understanding of the community participation concept. Second, focus group interviews were done to understand the perceptions of community members participating in the Delta NIRI partnerships. The case study sought to address three research questions: a) to describe the community-academia partnership structures in terms

of individual and community sector representation; b) to describe community participation, including reasons for joining the committee, and costs and benefits; and, c) to identify strategies community members perceived could be used to enhance community participation. Data collection commenced in the spring 2005. The University of Southern Mississippi Institutional Review Board (IRB) approval was received before the study commenced. Each data collection method is described below.

Review of documents

Before visiting the research sites, the researchers comprehensively studied each of the communities and community-academia partnerships in terms of demographic data, committee structures, and community participation. Current and historical documents that related to the community-academia partnerships in these communities were examined to develop a chronology of activities related to the establishment and growth of the partnerships. The documents were obtained from the Delta NIRI project archives as well as from community liaison offices. The community partnerships that were the units of analysis are labeled communities A, B, and C.

Content analysis of the documents was conducted for various theoretical propositions. Content analysis is a research technique for making replicable and valid inferences from text to the contexts of their uses (21). It is used to examine trends and patterns in documents. Krippendorff's (2004) six components of content analysis guided the content review of committees' documents. These were:

- Unitizing. The documents analyzed were community-academia committee meeting minutes, membership rolls, activity reports, and procedures and by-laws. Meeting minutes from the three community-academia committees were examined for structure of the partnerships, frequency of meetings, bylaws and policies and, sector representation.
- Sampling. Only minutes that resulted from committee sessions that were conducted with at least one community member in

attendance were examined. The meeting minutes examined covered the period June 2002 to December 2004 for Community A committee; September 2002 to December 2004 for Community B committee; and October 2002 to December 2004 for Community C committee. A total of 24 Community A, 23 Community B, and 59 Community C meeting minutes were examined. Attendance rolls from the committees' meetings were examined for frequency of attendance according to community sectors.

- Recording/coding. Documents were coded according to four propositions. These were committees' organizational structures, community members' demographic characteristics, community participation at meetings, and community activities and events. Community activity reports were examined for the variety of community activities in which the committee had participated, and attendance of community-academia committee members in those events. Bylaws, policy and procedure documents from the three committees were examined to understand the committees' structures as well as the regulations that govern their functioning.
- Reducing data. The researchers categorized data according to a priori coding content analysis, where theoretical categories were established prior to analysis as indicated above.
- Inferring contextual phenomena. Inference was made from the reduced data.
- Narrating the answer to the case study research questions. The inferences drawn from the reduced data were used to answer the case study research questions.

Focus group interviews

Data on perceptions of community participation in the Delta NIRI committees were collected using focus group interviews. The focus group questions were

piloted with members of a community-academia committee working in tobacco prevention. Modifications were made to improve the questions following the piloting. Focus group interviews were conducted in each of the three sites with community members that were members of the Delta NIRI committees. Focus group participants were purposively selected from a list of active committee members who had attended at least three committee meetings in the past year. Recruitment of focus group participants was conducted in three steps. Participants were contacted by phone two weeks before the interview. A week before the interviews, participants received a letter describing the study and inviting them to the sessions. This was followed-up by a phone call to each participant a day before the focus group sessions. All active members were invited to the focus group sessions. The focus group sessions were conducted in the committees' meeting venues. Two focus group discussions with 2 to 8 participants each were conducted in each of the three communities. There were a total of 33 respondents. Most were female, African American and above 50 years of age. Table 1 describes the characteristics of the focus group participants in each community. The length of the interviews ranged from one and one half to two hours. The same focus group moderator conducted all interviews in the three communities to avoid bias. An incentive of a \$20 gift card was offered to participants.

Focus group sessions were audio taped and an assistant moderator made supplementary notes. Immediately following the sessions, the moderator and the assistant moderator debriefed each other by sharing their insights on key points and notable quotes. The researcher through a series of steps transcribed the focus group audiotapes verbatim. The researcher listened to the tapes several times to gain a sense of the whole. This was followed by the actual transcription. The transcripts were then coded into sections relevant to the research questions. Within these sections, themes were identified. Data in the themes were then categorized, summarized and interpretive statements included. Results of the focus group analysis were discussed and confirmed with the moderator and were shared with participants as recommended (22).

Table 1. Focus group interview participants' characteristics

		FNIRI		HNIRI		MNIRI		Total
		Session I	Session II	Session I	Session II	Session I	Session II	
Total		2	6	8	7	5	5	33
Gender	Female	2	6	5	6	4	4	27
	Male			3	1	1	1	6
Age	20-50		1	4	5			10
	51-60		3	4	1	2	3	13
	Above 60	2	2		1	3	2	10
Race	African American	2	6	8	7	2	4	29
	White					3	1	4

Data analysis

Because this study used a case study design with two types of data collection methods, data were analyzed using strategies suited to each data type. Individual data analysis was then followed-up with methodological triangulation in which data from the document review and focus group interviews were compared to determine overall findings of the case study. Analysis was conducted on each individual community followed by a combined analysis comparing the three communities. A case study report was produced.

Results

The three community-academia committees were established as a partnership among the communities, the United States Department of Agriculture, Agricultural Research Service (USDA-ARS), and three to four universities in each of the states of Louisiana, Mississippi, and Arkansas. The committees adopted community participatory structures to analyze health in the communities, identify nutritionally responsive problems, and design, conduct, and evaluate nutritional interventions that could be sustained at the community level. The vision of the three committees was to improve health and well-being of community members. Their mission was to assess the nutrition and dietary needs of the community and develop intervention models to meet the community's nutritional needs in an effort to modify residents' food choices, preparation methods,

food availability, and food security. The committees hoped to achieve the goal of modifying the nutritional and physical lifestyles of community residents to alleviate the long-term dietary effects of diabetes, hypertension, heart disease, and obesity, and promote a healthier way of life. The committees were managed through cooperative agreements between the Delta NIRI project and local agencies; a local non-profit agency in the case of Community A; the mayor's office for Community B; and, the Police Jury for Community C. Membership in the committees was open to, but was not limited to, residents of the defined community and any institutions and agencies serving the communities, including the health department, non-profit organizations, businesses, and the media.

Committee meetings

Each of the community committees met regularly, once a month for Community A and B committees, and twice for Community C committee. In addition, the committee sometimes met more often to accomplish specific tasks. Meetings were conducted in a face-to-face type format in all communities. Community C committee also conducted some of its meeting by conference call. Elected officials led the committee with chairpersons always being from the community. The committees conducted their business through the general committee or by formation of subcommittees to manage specific tasks. Figures 1, 2, and 3 describe the subcommittees under each community-academia committee.

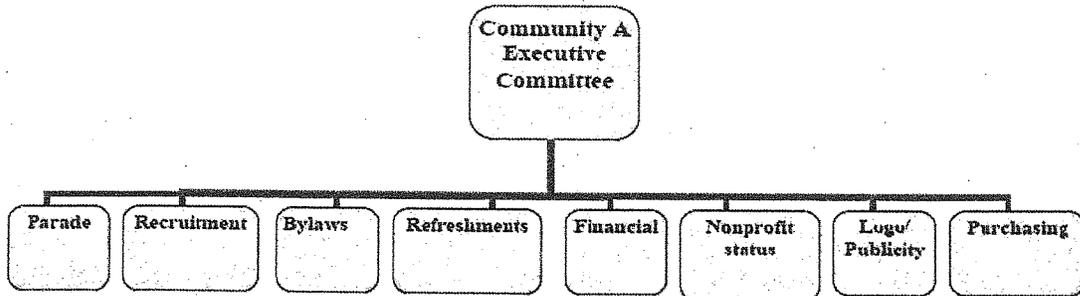


Figure 1. Community A subcommittees.

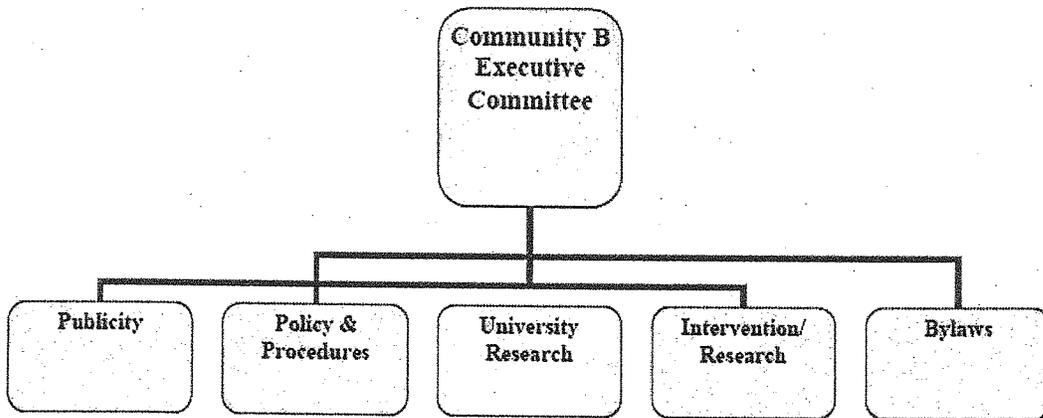


Figure 2. Community B subcommittees

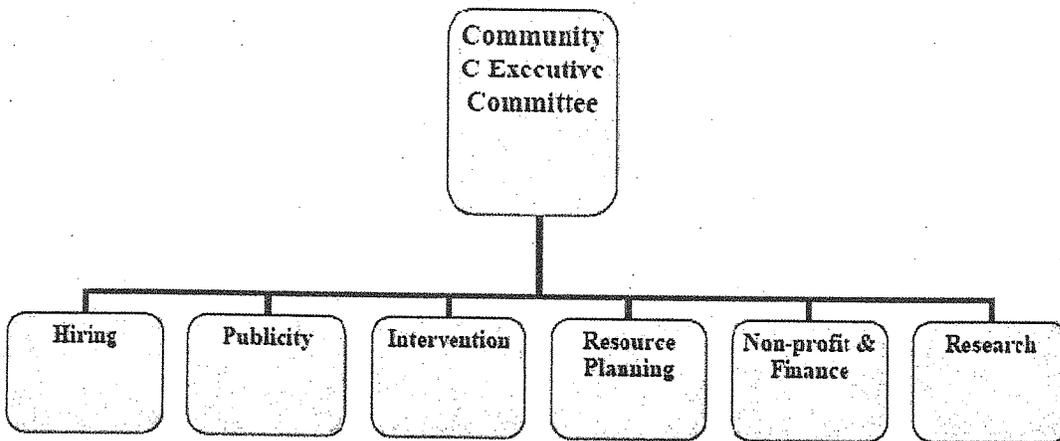


Figure 3. Community C subcommittees

Committees' activities

From a review of documents, it was evident that the committees were engaged in a variety of activities in

the community (Table 2). The goals of the activities ranged from raising awareness about nutrition and physical activity, and the committees' work, to recruitment, education, and training sessions.

Table 2. Delta NIRI community committee activities

Category of Activity	
Raising awareness about Delta NIRI project to community groups and the whole community	Christmas parades
	Hometown Health Improvement Coalition Presentation
	Summer festival
	Rotary club meeting
	Delta NIRI informational meeting with community leaders
	Catfish festival
Providing nutrition and other health services to the community	Parents and Grandparents Day Program
	Healthy dish tasting demonstration/ Healthy Holiday Food Sampling
	Community Nutrition Awareness meeting/ Nutrition Health Summit
	Community medical screenings open house/ Take a loved one to the doctor day health fair/ Community Health Day
Intervention planning	Focus group training/Community focus group interviews/ Intervention planning focus group
	Needs assessment workshop
	Informational meeting on intervention ideas with a group of church ministers
	Recruitment of potential intervention participants/Walking club recruitment
Implementation of nutrition and physical activity interventions	Summer nutrition and physical activity enrichment program for youths
	Summer Youth work program orientation
	Walking trail kickoff
	Smart shopping as part of summer enrichment program for youths
	Peer Health Educator Training

Community participation

Summary of themes related to community representation. Focus group participants from all the three committees acknowledged the importance of having a diverse committee that represented their community. Participants felt that a diverse committee added strength, and all the members of their communities stood to benefit from the work of the committees. All groups felt it was important to bring in people who represented different ages, races, and opinions in the communities. These views were captured in the quotes below:

'People are strong in different areas. You find their strengths especially if they want to reach out into the community, to try to involve them. That's what the community committee is made of, people with different strengths. We all work together and when people find out that am needed they get involved.'

'But see, if you can get that 18 to 39 (age) group in place, they probably would reach back and get that (the under 18).'

'I would like to see more white people in here.'

These perceptions from the focus groups interviews were supported by a review of documents with regard to racial and age representation. For those committee members whose data were available, most were African American and above 50 years of age (tables 3 and 4). This trend did not reflect the wider community racial/ethnic demographics (table 5). According to the 2000 US census, Community A's population was 67.2 percent White and 31.6 percent African American; Community B's population was 16.1 percent white and 83.2 percent African American, and Community C's population was 40.4 percent white and 58.1 percent African American.

Table 3. Race/ethnic categories of FNIRI committee community members

Race/Ethnic Group	Number		
	Community A	Community B	Community C
African American	35	23	26
White	13	5	8
Data not available	24	6	45
Totals	72	34	79

Table 4. Age categories of community committee members

Age Category	Number of Community Committee Members		
	Community A	Community B	Community C
31-40	2	6	2
41-50	6	8	5
51-60	33	7	19
Above 60	7	7	11
Data NA	31	6	42
Total	72	34	79

If the committee community membership truly reflected the community racial/ethnic demographics, then there would have been a greater number of White committee members in Communities A and B committees. Participants in all three communities also expressed a need for greater participation by younger community members, especially those between the ages of 18 and 40. The 2000 US census data indicate that 31.9 percent of Community A, 31.5 percent of

Community B, and 25.8 percent of Community C were between 20 and 44-years-old. From a review of committee membership records, these age groups were under-represented in the committees, especially in communities A and C, and did not reflect age demographics in the communities. A review of documents indicated that most community sectors were represented in the committees to varying degrees (see table 6). Community A committee had more members coming from the religious sector.

The education sector was well represented in the Community B committee, with most of the community committee members being associated with the local school district. Community C committee members were mostly laypersons. In all three communities, the focus group participants expressed a need to recruit more members from different sectors. Emphasis was especially placed on greater involvement of the church, the city/parish government, as well as under represented sectors such as businesses.

Table 5. Community profiles from the US Census 2000

General Characteristics	Community A		Community B		Community C		United States
	No.	%	No.	%	No.	%	%
Total population	21,263	100.0	3,437	100.0	1,395	100.0	100%
Male	10,140	47.7	1,533	44.6	620	44.4	49.1%
Female	11,123	52.3	1,904	55.4	775	55.6	50.9%
Median age (years)	35.9	NA	28.3	NA	37.6	NA	NA
Under 5 years	1,535	7.2	303	8.8	135	9.7	6.8%
18 years and over	15,332	72.1	2,221	64.6	968	69.4	74.3%
65 years and over	3,258	15.3	377	11.0	283	20.3	12.4%
White	14,281	67.2	552	16.1	563	40.4	75.1%
Black or African American	6,721	31.6	2,860	83.2	810	58.1	12.3%
Hispanic or Latino (of any race)	160	0.8	26	0.8	11	0.8	12.5%
Average household size	2.64	NA	3.10	NA	2.47	NA	NA
Average family size	3.13	NA	3.72	NA	3.14	NA	NA
Social Characteristics							
Population 25 years and over	13,423		1,870		869		
Economic Characteristics							
Median household income (dollars)	22,964	NA	20,135	NA	22,368	NA	NA
Per capita income (dollars)	12,675	NA	9,251	NA	16,797	NA	NA
Families below poverty level	1,334	23.1	232	28.4	80	22.6	9.2%
Individuals below poverty level	5,818	28.4	1,324	38.6	395	29.5	12.4%

Table 6. Community sectors represented in community-academia committees

Sectors	Numbers of Community Members			Total
	FNIRI	HNIRI	MNIRI	
Education	8	11	4	23
Health	1	6	2	9
Religion	16	0	1	17
Informal Community leader	4	1	4	9
Lay Persons	0	0	13	13
Government	8	7	4	19
Business	0	2	0	2
Voluntary/Private organization	5	0	8	13
Key leaders (Such as Mayor, School Principal)	0	1	1	2
No data available on sectors	30	5	42	77
Total Number of Community Participants	72	35	79	186

Reasons for joining committee and benefits of participation

Focus group participants from the three committees mentioned reasons for joining the committees. Participants also described the benefits and costs of participation.

Concern for personal, family, and community health was a common theme that emerged in the communities as a reason participants joined the committees.

'The reason why I came is I have kids. ... So I just trying to do something healthy for them and myself.'

'The eating habits are killing a lot of my people.'

'Diabetes is prevalent; not only at our school but in the community and that's one of the things we want to combat. But not only that but obesity, that's prevalent in our community even with our young children. Sometimes especially with our young children; it's something that we got to combat.'

The opportunity to network was a common theme in both Communities B and C.

'And I think we all, know what we need to eat but it just helps to have somebody in your ear, putting it out there and telling you this is what you need to do. Telling me you need to eat more fruits and more vegetables.'

'It's been a great experience just to know that you are not out here by yourself. You are working on a world issue, an international issue, about health and food.'

All three groups agreed that learning about nutrition and healthy eating, as well as positive changes in health behavior were benefits of participation.

'Am more conscious of what I eat and the amount that I eat'

'And since I've been in this Delta NIRI program, I've learnt to try eat right, and I know I have, cuz I've lost weight and I feel good and my blood pressure is on key.'

'After I coming to these meetings and I go back home, I keep thinking, now what can really do as a group to really impact what our children is eating. The grocery stores that you was talking about one time ... I look at stuff like that, do they really have the right kind of food, do they have enough money to buy the right kind of food? These questions I used to not ask. Since I got to NIRI I think I ask them.'

Costs of participation

The time and commitment required to serve on the committees was a common theme on sacrifices made by community members. Having to do committee projects' paper work and serving on multiple subcommittees were mentioned as costs by Community C participants.

'The sacrifice of working with people. Most of times you don't have to work with people, but when you are committed to something like HNIRI, to the meeting and stuff like that. That makes a big difference when people take time out of their work schedules to come to this community organization. Building relations like that is a sacrifice for people'

Interestingly, having to keep up healthful eating behaviors was also mentioned as a sacrifice by Community B participants.

'You do it all the time. Like you pass (a fast food outlet). You smell that fried chicken! Hard to keep going!'

Strategies to enhance community participation

Participants in the three groups acknowledged that community participation was essential to the success of the committees' efforts. The three groups shared five common themes on strategies to encourage participation. These were, publicizing the committees' activities in the community; promoting benefits of participation; making visible progress in interventions; partnering with other community groups working towards similar goals; and, targeting community leaders, especially church ministers.

'Well church groups could help us some. We could take it to the churches more and to mention it more to the organizations within the churches. I think that would help a lot to pull all the people in.'

'You are more inclined to try something if somebody comes to you and says, "Hey, I am eating right, am exercising, my high blood pressure I was taking two pills a day, doctor said I can take one pill a day now" or, "I was on the shots for my diabetes but I don't have to take the shots I can control with the pills." Once you get those positive results and people see those positive results, then they will be more inclined to join up.'

'We are going to be looking at producing a newsletter.'

Groups to target

All three groups wanted to see greater participation by youth, children and parents, churches, and the school

system in committees' activities. Other groups mentioned were the elderly, farmers, the medical community, and business people.

'And those ministers who get up and minister to the people, on any other thing, would be the persons to promote it from the pulpit. That's a good way to get it out.'

'We need to get the children involved cause usually you can reach those parents through the children.'

Discussion

A positive organizational climate predicts satisfaction and participation in community coalitions (23). The NIRI committees were formed from a partnership of the community, universities, and the USDA-ARS. This structure is likely to enhance the capacity of community members as it allows the partners to share knowledge and skills. Community members benefited from interaction with the universities and USDA-ARS partners by gaining resources and research knowledge. The universities and USDA-ARS benefited from the community by gaining an insider's perspective of the community (10). This was determined by earlier research which evaluated the community members' perceptions of effectiveness, barriers, and factors related to success of the community-academia partnerships (24).

Community participation is essential for the success of community-academia partnerships and coalitions (8,12,25). Participation is an essential component in both empowerment and sustainability dimensions. Participation is thought to promote empowerment at the individual, organizational, and community levels (13). Participants in this study were in agreement that participation of community members in the NIRI committees' activities was essential to achieving the objectives of the project.

Strategies to enhance community participation in the CBPR process have been identified, including taking time to interact with the community and using multiple approaches to engage the different parts of the community. These were also themes common to successful CBPR programs (8). Participants in this study identified strategies that could be used to enhance community participation in the NIRI committees. These included publicizing NIRI

activities in the community; promoting benefits of participation; making visible progress in interventions; and collaborating with other community groups working towards similar goals such as the churches and targeting community leaders especially, and ministers. Other strategies are recruiting and training community members in the research process (12) and planning for participation in advance in order to identify and gain participation of essential community sectors and individuals (11).

The question of whether the NIRI community committee members truly represented their communities was addressed in this study. There was a perception that the committees did not adequately represent all the racial/ethnic groups in the community in Communities B and C. This raised the question of who truly represents the community and how the NIRI communities were defined. They observed that greater community participation would increase the likelihood of the committees representing all facets of their communities. New recruitment strategies were later implemented including reaching out to the youth through summer work study programs.

Participation of community organizations and individuals in community-academia partnership is influenced by the perceived costs and benefits of participation. Costs that may impede the success of the partnerships include the length of time required to plan and implement interventions and witness change (25); activities the board members maybe involved in that require their time and attention; lack of resources to meet community needs; and competing agendas from the various agencies represented in the coalition (11,25). However, if sufficient strategies and plans are put in place right at the beginning of the research effort, the costs can be minimized resulting in successful partnerships. For instance, the length of time required to see results can be addressed by clearly describing the time frame for various activities in the research proposal (11). Participants in this study shared the common theme of concern for health as a reason for participating in the committees. They also identified the opportunity for networking as another reason for participating. The NIRI community committee members' benefits of participation were mostly solidarity and purposive benefits rather than material benefits. This may have implications for

sustainability. Committee members that are motivated to participate on a voluntary basis for the good of the community are more likely to keep the committee's work going after the exit of the outside partners.

Participation facilitates empowerment of communities through capacity building and creation of an enabling environment that empowers the community. Empowerment in turn promotes ownership, which is achieved through collective action, decision-making, and strategies such as education to increase knowledge and awareness (26). Enhanced community participation results in an increased sense of ownership. It is clear that community members in the Delta NIRI partnerships had a sense of ownership of the nutrition interventions planning processes. They were actively involved in the community-academia committees and realized the benefits of participation both individually and to the larger community. However, they were also well aware of the costs of participation. It can be assumed that for community members participating, the benefits outweighed the costs. It is important that when CBPR methodological strategies are utilized that cost be minimized to attract greater participation from the community.

A follow-up study was conducted to examine the experiences, lessons learned and perceptions of academic partners engaged in the community-based participatory project. This follow-up study explored the benefits and challenges of academics working with and in communities, and highlighted the difficulties that they faced in meeting the community's and funding agency's needs. The findings from the two studies were used to make recommendations to maximize the benefits of CBPR to promote nutrition and health within the Delta project, as well as overcome barriers and address institutional challenges.

Acknowledgment

This study was funded by U.S. Department of Agriculture, Agricultural Research Services Project #6251-53000-003-00D

References

- [1] Green LW, Mercer SL. Can public health researchers and agencies reconcile the push from funding bodies and the pull from communities? *Am J Public Health* 2001;91(12):1926-9.
- [2] Zakus J, Lysack C. Review article. Revisiting community participation. *Health Policy Plan* 1998;;13(1):1-12.
- [3] Declaration of Alma-Ata International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978. *Development* 2004;47(2):159-60.
- [4] Catford J. The Ottawa charter and after. *World Health* 1997;50(3):6.
- [5] Green LW, Kreuter MW. *Health promotion planning: An educational and ecological approach*. Palo Alto, CA: Mayfield, 1999.
- [6] Eng E, Parker E. Measuring community competence in the Mississippi Delta: The interface between program evaluation and empowerment. *Health Educ Quart* 1994;21(2):199-220.
- [7] Filbert E, Chesser A, Hawley SR, St. Romain T. Community-based participatory research in developing an obesity intervention in a rural county. *J Comm Health Nurs* 2009;26(1):35-43.
- [8] Eisinger A, Senturia K. Doing community-driven research: A description of Seattle Partners for Healthy Communities. *J Urban Health* 2001;78(3):519-34.
- [9] Israel BA, Lichtenstein R, Lantz P, McGranaghan R, Allen A, Guzman JR, et al. The Detroit Community-Academic Urban Research Center: Development, implementation, and evaluation. *J Public Health Manage Pract* 2001;7(5):1.
- [10] Ndirangu M, Perkins H, Yadrick K, West JR, Avis A, Bogle ML, Santell R, et al. Conducting needs assessment using the CPPE model to develop nutrition and physical activity interventions in the Lower Mississippi Delta. *Progr Comm Health Partnerships* 2007;1(1):41-8.
- [11] Lindsey E, McGuinness L. Significant elements of community involvement in participatory action research: evidence from a community project. *J Adv Nurs* 1998;28(5):1106-14.
- [12] Kone A, Sullivan M. Improving collaboration between researchers and communities. *Public Health Rep* 2000;115(2/3):243.
- [13] Zimmerman MA. Psychological empowerment: Issues and illustrations. *Am J Comm Psychol* 1995;23(5):581.
- [14] Thibaut JW, Kelley HH. *The social psychology of groups*. New York: Wiley, 1959.
- [15] Clark PB, Wilson JQ. Incentive systems: A theory of organizations. *Adm Sci Quart* 1961;6:129-66.
- [16] Prestby JE, Wandersman A, Florin P, Rich R, Chavis D. Benefits, costs, incentive management and participating in voluntary organizations: A means to understanding and promoting empowerment. *Am J Comm Psychol* 1990;18(1):117-49.
- [17] US Census Bureau. Fact sheets: Highlights from the census 2000 demographic profiles. Assessed June 04. URL:<http://factfinder.census.gov>
- [18] Champagne CM, Bogle ML, McGee BB, Yadrick K, Allen HR, Kramer TR, et al. Dietary intake in the lower Mississippi delta region: results from the foods of our delta study. *J Am Diet Assoc* 2004;104(2):199-207.
- [19] Yadrick K, Horton J, Stuff J, McGee B, Bogle M, Davis L, et al. Perceptions of community nutrition and health needs in the lower Mississippi Delta: A key informant approach. *J Nutr Educ* 2001;33(5):266.
- [20] Yin RK. *Case study research: Design and methods*, 3rd ed. Thousand Oaks CA: Sage, 2003.
- [21] Krippendorff K. *Content analysis: An introduction to its methodology*. Thousand Oaks CA: Sage, 2004.
- [22] Krueger RA, King JA. *Involving community members in focus groups: Focus group kit 5*. Thousand Oaks CA: Sage, 1998.
- [23] Butterfoss FD, Goodman RM, Wandersman A. Community coalitions for prevention and health promotion: Factors predicting satisfaction, participation, and planning. *Health Educ Quart* 1996;23(1):65-79.
- [24] Ndirangu M, Yadrick K, Bogle M, Graham-Kresge S. Community-academia partnerships to promote nutrition in the Lower Mississippi Delta: Community members' perceptions of effectiveness, barriers, and factors related to success. *Health Promot Pract* 2008;3:237-45.
- [25] Lantz PM, Viruell-Fuentes E, Israel BA, Softley D, Guzman R. Can communities and academia work together for public health research? Evaluation results from a community-based participatory research partnership in Detroit. *J Urban Health* 2001;78(3):495-507.
- [26] Restrepo H. *Increasing community capacity and empowering communities for promoting health: Draft Technical Report*. Presented Fifth Global Conf Health Promot, Mexico City, 2000 Jun 5-9.

Submitted: November 03, 2009.

Revised: December 22, 2009.

Accepted: January 07, 2010.