

**EFFECTS OF SOCIOECONOMIC DEVELOPMENT ON
HEALTH STATUS AND HUMAN WELL-BEING:
DETERMINING IMPACT AND EXPLORING PATHWAYS OF CHANGE**

**Proposals For Phase II of the BRAC-ICDDR,B Matlab Joint Project
1996 - 2000 AD**

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Preface

Empirical evidence point to a causal relationship between the socioeconomic status of individuals and communities and their health. Indeed improvement in health is expected to follow socio-economic development. Yet this hypothesis has rarely been tested; at least it has not undergone the scrutiny of scientific inquiry. Even less understood are the processes and mechanisms by which the changes are brought about.

The Rural Development Programme (RDP) of BRAC is a multisectoral integrated programme for poverty alleviation directed at women and the landless poor. It consists of mobilization of the poor, provision of non-formal education, skill training and income generation opportunities and credit facilities. The program is the result of 20 years of experience through trial and error. However evaluation of its impact on human well being including health has not been convincingly undertaken.

The Matlab field station of ICDDR,B is an area with a population of 200,000, half of whom are recipients of an intensive maternal and child health and family planning services. The entire population is part of the Center's demographic surveillance system where health and occasionally socio-economic indicators have been collected prospectively since 1966.

A unique opportunity arose when BRAC decided to extent its field operations (RDP) to Matlab. ICDDR,B and BRAC joined hands to seize this golden occasion. A joint research project was designed to study the impact of BRAC's socio-economic interventions on the well being of the rural poor, especially of women and children, and to study the mechanism through which this impact is mediated.

In order to share the progress of the project and its early results, a working paper series has been initiated. This paper is an important addition in this endeavour. The project staff will appreciate critical comments from the readers.

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1.0 Bangladesh: Development, Health and Well-being.

Bangladesh is popularly described in the literature as a 'test case for development' in view of the complex nature of its socioeconomic and cultural problems, coupled with severe resource constraints. It ranks as one of the poorest countries in the world, with 78% of the population falling below the poverty line and it is also the most densely populated at 800 persons per square kilometre. The gross national product (GNP) is \$220 US dollars per capita (World Bank 1994), while GNP per capita adjusted for purchasing power is about \$880 US dollars (Hogendorn 1992). Over the last three decades, a doubling of the rural population has produced a substantial decline in real wages and a marked increase in the proportion of landless and destitute households (Bangladesh Bureau of Statistics 1991). Although 80% of the population is classified as rural, approximately a half of this total are landless (UNDP 1991).

Reflecting these adverse economic and environmental conditions, as well as the inadequate health services, are the high infant and child mortality at 109 and 150 per 1000 respectively (UNDP 1994). Gender differentials in mortality are apparent by seven months of age, when the mortality rate for female infants exceeds male levels. Malnutrition and diarrhoea account for over one third of under-five mortality. According to a recent survey of child nutritional status, over two thirds of children under five years of age are either stunted, and/or wasted (Bangladesh Bureau of Statistics 1991). Bangladesh has one of the highest maternal mortality ratios in the world at 600 per 100,000 live births, due mainly to young age of marriage, closely spaced pregnancies, low nutritional status, and insufficient prenatal care and lack of appropriate obstetric health services. A trained health worker attends only 7% of deliveries, while 34% of newborn babies are of low birth weight (UNDP 1991).

In addition to the public sector, a wide range of non-governmental and private organizations is engaged in development activities in Bangladesh. Of these, BRAC (Bangladesh Rural Advancement Committee) is distinguished for its multisectoral development work with the rural poor. In 1992, BRAC extended its comprehensive Rural Development Programme (RDP) to 100 villages of Matlab thana (sub-district) where ICDDR,B (International Centre for Diarrhoeal Disease Research, Bangladesh) has been involved in demographic surveillance and health interventions research since the early 1960s.

In view of the available historical and prospective demographic and health data on the - population of Matlab thana, both institutions recognized a unique chance to determine, through a "natural experiment", the separate and synergistic impact of socioeconomic development on improving health status and human well-being.

In 1992 the Matlab Joint Project was initiated between BRAC and ICDDR,B with the specific objective of determining the impact of BRAC's rural development programme on changes in health status and well-being, using seven different sets of indicators. The project utilizes a four-cell experimental design with baseline, in-depth and follow-up studies, and cross-sectional and longitudinal surveys. It also employs an iterative approach to study design, which permits the use of innovative qualitative, quantitative, and participatory research methods for investigating the pathways through which possible changes in health and well-being might occur.

2.0 Research Objectives. Design and Methodology.

The broad objectives of the Matlab Joint Study are to:

1. Assess the independent and interactive effects of BRAC's rural development programme and ICDDR,B's MCH-FP programme on health status and human well-being;
2. Determine the mechanisms, or pathways, through which these programmes may influence, both positively and negatively, health and well-being;
3. Improve the effectiveness and efficiency of the two programmes, particularly in relation to the rural poor and for the greater benefit of women, and;
4. Develop national research capacity within Bangladesh to conduct such health and development research.

The identification of barriers and constraints to achieving improvements in health and well-being is equally relevant to both institutions, given their interest in determining the effectiveness of their respective interventions. It is also hoped that the investigation of pathways of change will assist programme efforts to achieve greater gender and socioeconomic equity in rural society.

Given the complex nature of the issues that this study addresses, the research needed to determine the impact of both the BRAC and ICDDR,B programmes, separately and when applied in combination, as well as explore pathways and causal mechanisms that might explain the research findings. It was decided, therefore, to implement the BRAC and ICDDR,B programme interventions in four combinations, so that different populations received only one of the following:

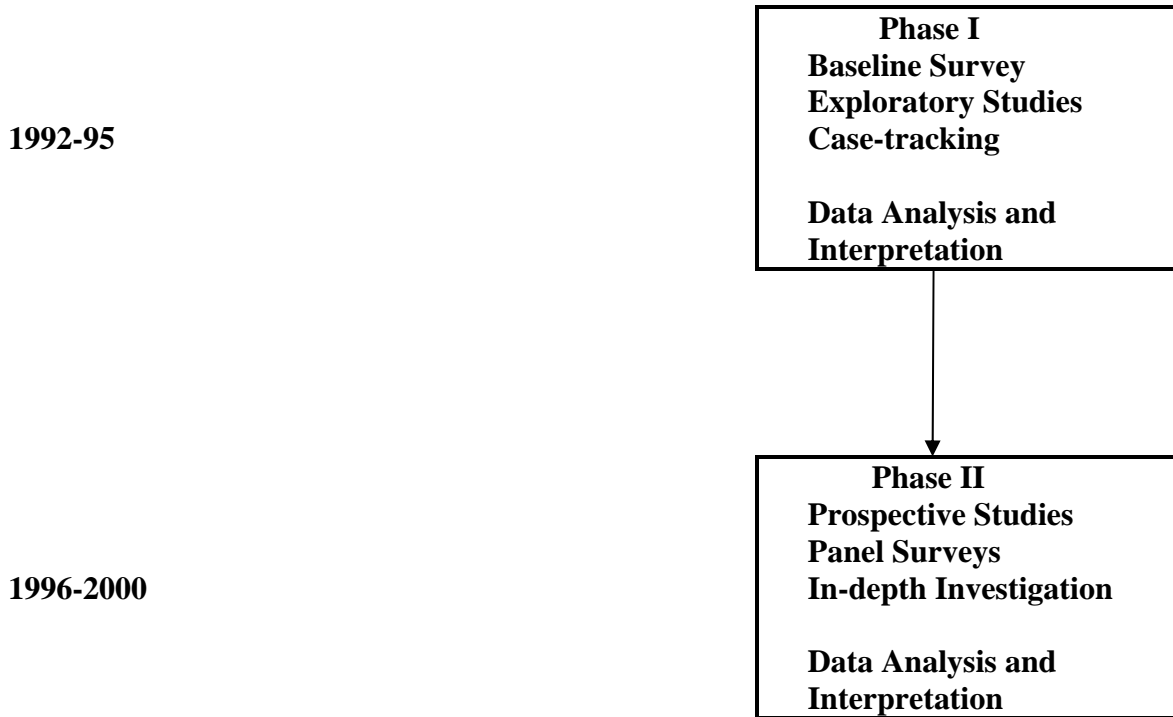
- both BRAC's Rural Development Programme (RDP) and ICDDR,B's Maternal and Child Health and Family Planning (MCH-FP) programmes;
- only the MCH-FP programme;
- only the RDP programme;
- neither the MCH-FP or RDP programmes, with only normal government and other non-government and private services being available.

Since the interventions were organized utilizing this four cell design, the research took advantage of this situation to provide scope for interdisciplinary theory building and methodological innovation. In order to capture the dynamic effects of rural development and to be able to explain possible pathways of change, the joint project adopted a shared or “transdisciplinary” approach that integrated a variety of theories, methods (quantitative, qualitative and participatory) and levels of analysis (Rosenfield 1992). Also integral to the study has been an iterative process of learning from the theory, methods and analysis as the research proceeded over time. This iterative process has permitted the refinement and development of the research methods as the project progressed, as well as facilitated ongoing feedback to theory building and action.

Summarized in Figure 1 below, the Matlab Joint Project consists of Phases I (1992-1995) and Phase II (1996 - 2000). Initiated in 1992, Phase I involved a large cross-sectional baseline survey and a series of exploratory studies to assess existing differences in the populations prior to BRAC’s RDP interventions. “These studies sought to elucidate the socioeconomic and environmental context within which the BRAC’s programmes would operate, including seasonality and market dynamics, and to evaluate specific BRAC inputs in terms of their content, degree of implementation and adoption by rural people in Matlab. Most of these studies were conducted on small samples in the vicinity of the BRAC project research station located in Uddamdi village, which is near the ICDDR,B research complex in Matlab town.

This present proposal concerns research plans for Phase II of the BRAC-ICDDR,B Matlab Joint Project to cover the period 1996 to 2000 AD. While a brief description of Phase I is provided here, the object of this proposal is to outline the plans for the second phase of research. Based on the research findings and hypotheses generated during Phase I, Phase II utilises in-depth studies to seek explanations on possible causal pathways, as well as large prospective surveys to determine the impact of RDP, either alone or in combination with MCH-FP, on changes in health status and human well-being.

Figure 1: Research Process for the BRAC-ICDDR,B Matlab Joint Project



3.0 Background to ICDDR,B and BRAC.

International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

Established in 1960 as the East Pakistan Cholera Research Laboratory, ICDDR,B subsequently expanded its work into the related fields of diarrhoeal disease control, nutrition and environmental health, as well as into demographic, fertility and community health research. Since the late 1970s the Centre has also been involved in intervention research into maternal health and family planning and on child health (MCH-FP programme), together with related communicable diseases. More recently it has placed greater emphasis on reproductive health and on strengthening its capacity to undertake social and behavioural qualitative research. The majority of the Centre's activities take place at a field station located in Matlab thana, a rural sub-district to the south-east of Dhaka, the capital city. In Matlab ICDDR,B operates a 70 bed hospital with clinic-based research and treatment facilities for diarrhoeal diseases, acute respiratory illnesses and malnutrition, which are provided free of charge. The demographic surveillance system and the MCH-FP programme are also based in Matlab.

Demographic Surveillance System (DSS): In 1966, the DSS was established in Matlab to monitor vital events such as births, deaths, migration and marriages and since 1975 it has covered a population of approximately 210,000 people spread over 142 villages. As one of the few large scale, longitudinal demographic studies in the developing world, DSS represents an invaluable resource for prospective demographic, socio-economic and public health research studies.

Maternal and Child Health and Family Planning Programme (MCH-FP): In 1977 the ICDDR,B initiated the MCH-FP Programme in the intervention area in Matlab, covering a half of the total DSS sample population, while the other half serves as the comparison area where health services are provided by the government. The MCH-FP services in the treatment area are delivered to the household by 80 female community health workers (CHWs) on a fortnightly basis. They provide family planning counseling and contraceptive delivery, carry out immunization and vitamin A supplementation, distribute oral rehydration therapy (ORT) and safe-delivery kits, and treat and/or refer mothers and children suffering from infectious diseases or malnutrition. In addition, each CHW maintains an ongoing record of morbidity and preventive services. The project also operates four health sub-centres within the treatment area, which receive referrals from the CHWs and provide maternity care, nutrition rehabilitation and health education. Professionally trained mid-wives are also based at the sub-centres.

ICDDR,B's experience in Matlab has shown that effective service delivery and method-mix for maternal and child health programmes, including diarrhoeal diseases and family planning, can positively influence health and fertility. For instance, a 20% rise in the prevalence of contraceptive use in treatment areas has occurred in a six year period --well above trends in the comparison area or the rest of rural Bangladesh (Koenig *et al.* 1987; Mitra *et al.* 1992). However, although there have been reductions in infant and maternal mortality, as well as in the burden of severe malnutrition, these have not been to the extent desired. The possibility of combining the potential benefits of rural development with health services was seen as a great opportunity.

Bangladesh Rural Advancement Committee (BRAC).

BRAC is an indigenous non-governmental organization involved in promoting the welfare and development of the rural poor (Lovell 1992). It was established in 1972 in response to the mass migration and resettlement of refugees in northeastern Bangladesh following the country's war of liberation. BRAC has subsequently spread nation-wide to involve over 20,000 villages and it is engaged in development for such activities as rural credit and enterprise, health, education and training. Its rural development and credit programme now include over one million village members, 70% of whom are women. At present, approximately 100 million dollars are disbursed as credit, with a repayment rate of 97%. BRAC has also established 26,000 non-formal primary education schools and 14 educational training centres (BRAC 1994).

BRAC's Rural Development Programme (RDP): This is an integrated, multisectoral initiative involving institution building, functional education, savings and group trust funds, credit disbursement, training in income and employment generation activities, legal literacy and non-formal primary schooling. The village work of RDP begins with the establishment of an Area Office (AO) and the identification of BRAC-eligible, or target households, which are those that own less than 0.5 acres of land and sell at least 100 days of manual labour per year. After discussions with these eligible households about their concerns and needs, they are encouraged to form Village Organizations (VOs) with a maximum of 55 members. Each VO member begins a savings routine, depositing a minimum of 2 taka every week.

Functional Education (FE): Over a one month period, VO members are required to spend two and a half hours per day participating in a "Paulo Friere-style" process of functional education, which aims to raise awareness about social, political and economic issues, and to develop basic literacy skills. This

programme is facilitated by a qualified trainer from the village who has attended a course offered at the BRAC Training and Resource Centre (TARC).

Credit and Savings: Following completion of the FE programme, collateral-free credit is provided to VO members who have regularly participated in weekly meetings, made compulsory deposits to the group and insurance fund, and met minimum savings requirements of 5% for the first loan, 10% for the second loan, and 15% for the third loan.

Legal Literacy and Training: Legal literacy is provided to female VO members to raise awareness on legal rights relating to inheritance, marriage and divorce. Training is also provided to VO members for human resources development and on occupational skills for specific income-generating activities, such as poultry and livestock raising, fisheries, vegetable growing, irrigation and social forestry.

Children's Non Formal Primary Education (NFPE): In RDP areas, the NFPE programme provides primary education to children aged 8-10 and 11-16 years of age who have dropped out of formal schools, government or private, and for those who have never enrolled. NFPE schools gives priority to the children of BRAC VO members and maintains a policy whereby 70% of the students are female. The curriculum covers Bangla, arithmetic and social studies, including practical lessons on health, nutrition, hygiene, sanitation, safety, first aid, ecosystems, community, geography and basic science.

Primary Health Care (PHC): BRAC's PHC programme aims to reduce maternal, infant and child morbidity and mortality among RDP VO members by facilitating their use of the health and family planning services provided by the government and BRAC. The PHC programme focuses on family planning, immunization (EPI), safe water and sanitation, health and nutrition education, basic curative services and the training of traditional birth attendants (TBA). In each village, a BRAC trained village health worker (VHW) maintains a record of couples of reproductive age, supplies oral contraceptives and condoms, and refers people requiring other methods to government FP workers. They also encourage the supply and use of low cost tubewells and ringslab/sanitary latrines, assist the government in distributing Vitamin A capsules, and promote vegetable gardening and exclusive breastfeeding for newborn children. VHWs also provide basic curative care for 10 common diseases and facilitate referrals to government health centres.

4.0 The BRAC-ICDDR,B Matlab Joint Project: Phase I, 1992-95.

The introduction of BRAC's RDP into Matlab thana, where the ICDDR,B had been monitoring demographic changes for almost 25 years, provided an unique opportunity for a "natural experiment" for prospective research on the relationship between socioeconomic development, health status and human well-being. Accordingly, in 1992 a joint research project was initiated by researchers from both institutions (Bhuiya and Chowdhury 1992). ICDDR,B wanted to evaluate the extent to which socioeconomic development might enhance MCH-FP effectiveness, while BRAC welcomed the opportunity to draw on the Matlab DSS data to determine the impact of RDP on health and well-being. Common to both organizations was an interest in understanding the explanatory pathways, and possible causal mechanisms, by which socioeconomic development might influence health and well-being in the rural poor.

In June 1992 an advisory committee of expert researchers met to discuss this collaboration and subsequently made recommendations for a baseline survey of 12,000 households in Matlab, sampled on the basis of the four-cell intervention and study design (BRAC- ICDDR,B 1994). In 1993 two further expert meetings were held, in Dhaka and at Harvard University, to conceptualize the issues and methods for the next phase of research. Concept papers were drafted on health (Scott, Evans and Cash 1993) and women's lives and well-being (Mahmud and Chen 1993), and an exploratory study was conducted on the use of participatory methods to assess health changes (Adams, Das Roy and Mahbub 1993).

In 1993 BRAC created its own management information system (MIS) to link the ICDDR,B DSS data and information with that on the BRAC RDP inputs. A research station was established in Uddamdi village, Matlab, and a series of pilot studies were undertaken to explore possible pathways of change and to develop relevant indicators. Drawing on these preliminary experiences, interdisciplinary workshops were held in 1994 to identify key hypotheses and pathways that could form the basis of the next phase of research.

The purpose of the baseline survey was to establish existing conditions in Matlab prior to the full introduction of the BRAC RDP socio-economic interventions. Sampling was based on the project's four cell study design and included populations receiving the following interventions: 1) BRAC's RDP and ICDDR,B's MCH-FP; 2) only the MCH-FP programme; 3) only the RDP programme; and 4) no RDP or MCH-FP programmes, but where government services were available.

In addition to basic demographic, nutritional and socioeconomic data, baseline questionnaires solicited attitudinal information on women's status and desired family size. Published results consider differences between the four cells described above (BRAC 1994). Although the BRAC RDP had not yet started at the time of the baseline, results were also expressed in terms of BRAC's eligible households.

Exploratory studies were also undertaken to map the various pathways by which BRAC RDP inputs might influence health behaviours and outcomes. Among these were in-depth studies of VO formation and NFPE in terms of pupil recruitment, participant attitudes and expectations, educational content, and social dynamics. Other investigations included an in-depth study of the circulation of credit, cash and capital in the Matlab economy, and an assessment of the use and profitability of loans acquired as a result of participation in BRAC RDP.

Other studies were explicitly aimed at identifying and developing appropriate indicators for Phase II. For example, indicators were formulated for measuring change in women's power and status as a result of participation in BRAC RDP. In a similar fashion, a standard of living index has been developed and participatory research methods field-tested for inclusion in Phase II. Ethnographic studies of Uddamdi village have been instrumental in identifying social, economic and cultural characteristics of Matlab, including seasonality, household composition, power relations, kinship, and mechanisms for health changes as perceived by villagers themselves.

5.0 Achievements in Phase I and Lessons Learnt,

The baseline survey was carried out in 1992 and much of the more recent work has included the implementation of the quarterly health and socioeconomic surveys, linking of DSS data with BRAC's

MIS data to examine the demographic rates in the four study cells, and preparation of draft reports based on some exploratory studies carried out earlier. All these activities were based on the conceptual framework developed during Phase I.

The major activities that were carried were during the Phase I included the following:

- Cross-sectional baseline survey;
- Quarterly health and socioeconomic surveys;
- Linking of data from the demographic surveillance system (DSS) of ICDDR,B with that from BRAC's management information system (MIS) containing the programme inputs;
- Case tracking;
- In-depth qualitative studies; and
- Mid-term review of the project.

Baseline Survey

The baseline survey was carried out in 60 villages covering 12,000 households, and included quantitative information on various factors, which are likely to be impacted by BRAC's development interventions. The data set contains information on a wide range of factors including socio-economic and demographic status, housing, water and sanitation, personal hygiene, morbidity, nutritional status and immunization, education and life skills, status of women status, and legal awareness. The baseline report documented the pre-intervention status of the population, which can be compared with later sets of information on the joint and independent effects of development and health intervention programmes.

Quarterly Health and Socioeconomic Surveys

The data collection instruments utilized in the quarterly surveys were developed on the basis of lessons learned from pilot studies carried out in the earlier years of the project. This was achieved by forming research teams that were assigned various substantive areas of work. The teams came up with their own work plans based on their experience of piloting and pre-testing in the field, with the results being discussed in plenary feedback sessions with other more experienced researchers. A series of group discussions were held before preparing a final set of hypotheses, making decisions on the methodologies to be used and the drafting of the questionnaires. In addition, these research plans and instruments were reviewed extensively by the mid-term review team (Drs. Marty Chen, Lincoln Chen, Wahiduddin Mahmud, Pertti Peltö; see below). Many of the team's recommendations were also incorporated in the final research.

The first round involved data collection from nearly 4,000 households, with about 1,000 from each of the four study cell populations, and it started in April 1995 and finished in August 1995. During this round, three questionnaires, one for households, one for women and one for men, were administered. The household module included information on household landholding, assets, savings, loans, income, expenditure, household composition, socioeconomic information of individual members, movement of

individuals, and health seeking behaviour. The men's questionnaire dealt with family planning related issues. The women's questionnaire included items on savings and loans, familial and environmental crises, childcare, water and sanitation, mobility, economic security, political awareness, household decision-making, fertility and reproductive health.

In addition, the above round also included anthropometric nutritional measurements in a sub sample of households. All the questionnaire and survey data collected during this round have been coded and entered into computer.

The second round of quarterly data collection was started within one week of completion of the first round. Most of the items included in the first round were also included during the second round. The topics dropped from the second round included the fertility questionnaires and some aspects of those covering income and savings. Some new items were included, such as immunization coverage and basic educational achievements of children.

DSS-MIS Linking: Demographic Rates

By using data from the ICDDR,B's demographic surveillance system and the management information system (MIS) of BRAC, it has been possible to calculate demographic rates for the four study cell populations at an aggregate level and for BRAC members and non-members at the individual level. This was possible by virtue of the unique identification numbers of the villagers maintained by the DSS of ICDDR,B, and using these numbers for BRAC members. This linking system, which has been tested and put in place during the first phase of the study, will continue and will provide the researchers with a unprecedented opportunity to examine the effect of the interventions prospectively.

Case Tracking

Under this group it was intended to follow a small number of BRAC members and a comparable group of non-members prospectively to document the extent of benefit a BRAC member may have derived economically, socially and otherwise by being with BRAC in compare to those who had not joined BRAC. Much of the effort during the first phase went into developing instruments and some progresses have been made. In this regard a pilot study on the profitability of BRAC financed projects has been carried out in Matlab. The basic objective was to look at the profit rates made by BRAC members once they have made investments in projects financed through BRAC loans. Other studies on this theme included continuous monitoring of a small sample of individual women to obtain detailed information on the circumstances under which they join or do not join BRAC, their use of loans and performance, and their perceptions of their own status and well-being. In this regard an instrument to measure the quality of women's life and psychological well-being has been developed and is being field tested.

In-depth Studies

A number of in-depth studies based on exploring the project's theme have been carried out. The major topics include female headed households, maritally disrupted women, the performance of the BRAC schools, and peoples' management of abortions. A number of reports have already been prepared on the basis of in-depth studies (see below).

Papers Drafted

A number of analyses were undertaken and completed during Phase I, including the following:

1. An inside look at two BRAC schools in Matlab Thana;
2. A qualitative exploration of some baseline issues in south Uddamdi, Matlab;
3. Female headed households: 'what makes them vulnerable?';
4. Marital disruption and reproductive outcome in rural Bangladesh;
5. Vulnerable of the Vulnerables: The situation of divorced, abandoned and widowed women in a rural area of Bangladesh;
6. The profitability of BRAC financed projects: a study of seven microenterprises in Matlab.

In addition to the above, 20 abstracts of papers were submitted for presentation at the Annual Scientific Conference (ASCON) of ICDDR, B that was held in Dhaka in January 1996. Of these, 13 were accepted for presentation.

6.0 Midterm Review of the Matlab Joint Project

An in-depth review of Phase I activities, as well as those proposed for Phase II, was undertaken by a team of international experts in January 1995. The review team commended the progress that had been achieved but also cautioned against the project becoming too ambitious (Chen *et al.* 1995: Appendix 1 contains the executive summary).

The team was of the opinion that the project holds great promise for path breaking research, on the outcomes and processes of rural development interventions on health, nutrition, reproduction, and quality of life of low income women and their families. The four cell study design provides an excellent opportunity to understanding how changes in demand factors can influence reproduction and other related issues in rural Bangladesh. This understanding can be a powerful contribution to development policy in Bangladesh and beyond.

The proposals for Phase II have taken the recommendations of the evaluation team into consideration.

7.0 Conceptual Framework for Studying Health and Well-being

7.1 Dimensions of health and well-being.

Underlying socioeconomic development policies and programmes are assumptions about their presumed benefits for raising health status and human well-being. These assumptions are based on a vast empirical literature which reveals the strong influence of socioeconomic factors on health, as well as the concomitant improvements seen over time in different sectoral indicators and the associated improvements seen in health and well-being. Indeed, marked gradients in socioeconomic differentials have been noted in life expectancy by income, education, occupational class for many different diseases and in diverse populations, ranging from Britain to Kerala state, India (Townsend and Davidson 1982; Kannan *et al.* 1991).

However, the large majority of studies that have investigated the relationship between socioeconomic development and health are either cross-sectional in design or depend on routinely collected data showing trends over time, which makes it difficult to explore the intervening pathways or mechanisms that link socioeconomic development, health and well-being. The dearth of research on such mechanisms, particularly based on experimental study designs, is probably a result of the methodological complexity involved in this type of inquiry.

A well documented example from the developing world is the association between maternal education and increased child survival. In attempting to explain this association, various researchers have pointed to intervening pathways ranging from enhanced participation in bureaucratized health care systems, increased personal competence in hygiene and child-care, and greater socioeconomic aspirations (Levine *et al.* 1994, Caldwell 1979, Caldwell, Reddy and Caldwell 1985, Caldwell 1986, Cleland and van Ginneken 1988). However, as Cleland and van Ginneken (1988) noted, in the large majority of studies these pathways are referred to as speculative assumptions and they remain as an ill-understood “black box” in socioeconomic development. The assumption that improving maternal education will lead to improved child survival is widespread and has been incorporated into many policy documents. However, this assumption has not been tested in well controlled intervention studies.

For the purposes of this study, health status and human well-being can be represented as encompassing seven dimensions, including morbidity and mortality, nutritional status, fertility, household income and livelihood, women’s lives, and the environment (see Figure 2).

Figure 2. Seven Dimensions for the Improvement of Health Status and Human Well-being

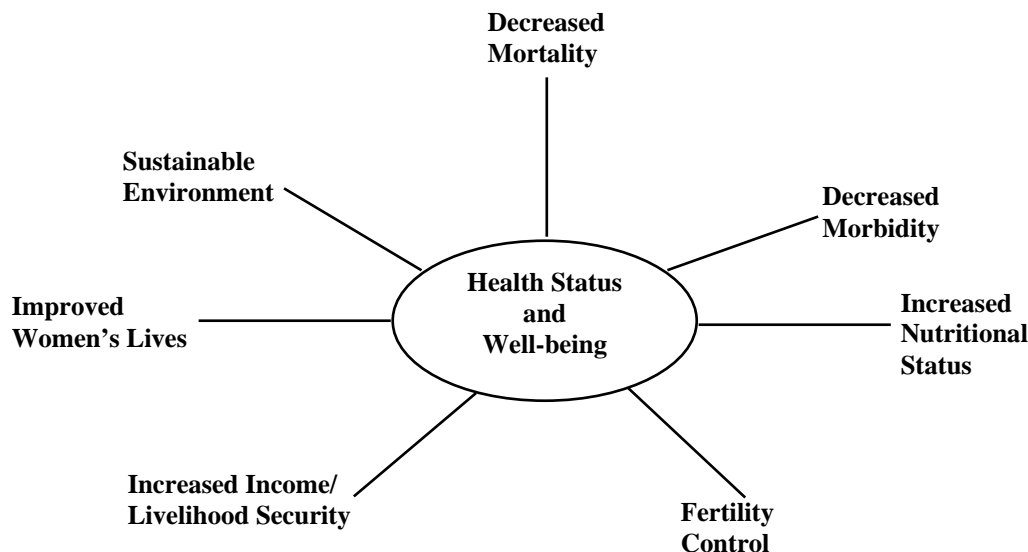


Figure 3. Hypothesized Pathways Linking ICDDR,B's Health and BRAC's Rural Development Programme to Improvements in Health Status and Human Well-being

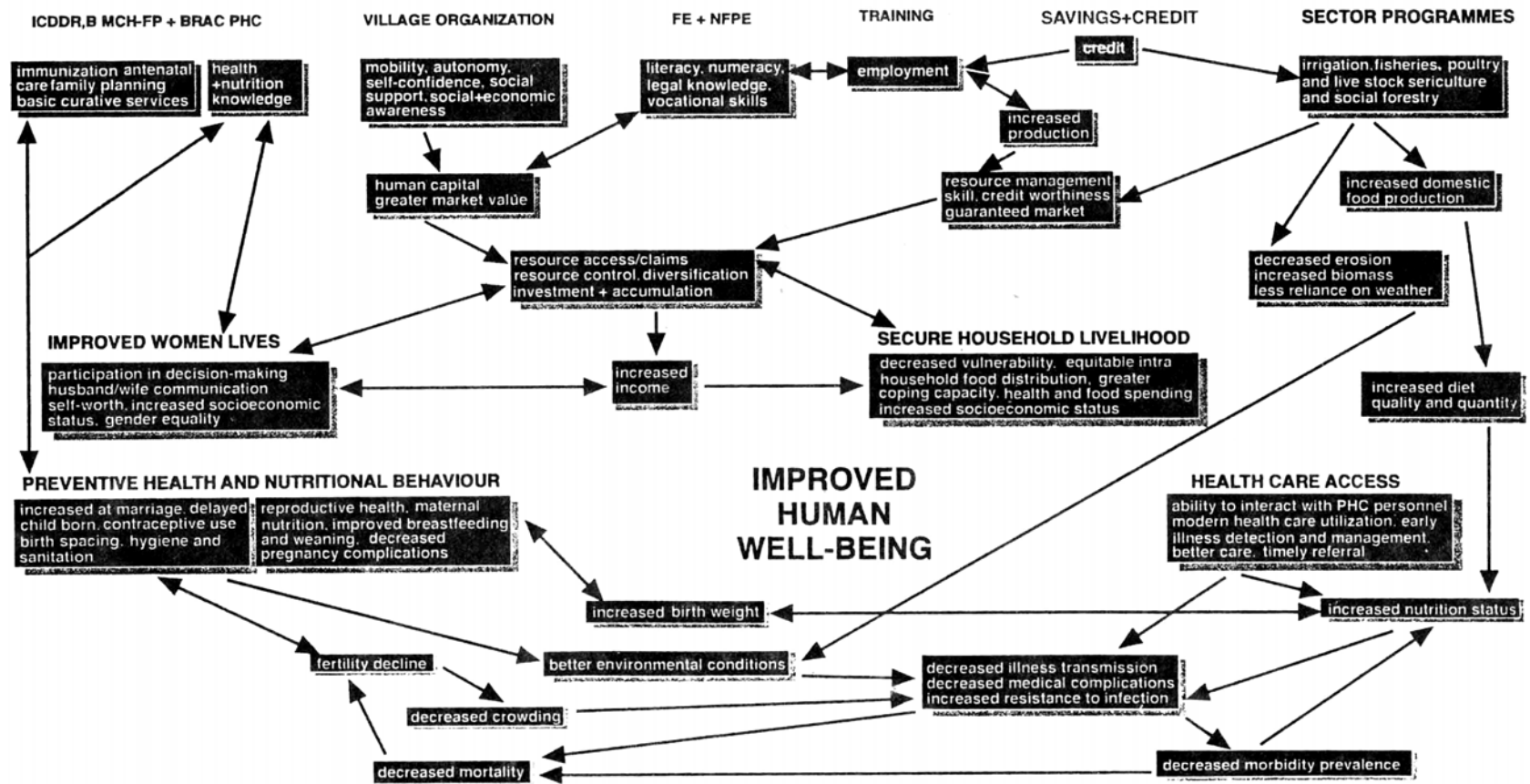


Figure 3 indicates possible ways in which BRAC's rural development programme may influence the different dimensions of health and well-being, through a web of hypothesised intersecting pathways (Chowdhury 1994)¹. In this framework, certain dimensions might act as intermediary variables in pathways of change, in addition to representing health status and well-being outcomes in their own right. For example, increased income acquired as a result of participation in BRAC RDP may enhance women's lives, status and autonomy, while also decreasing morbidity, mortality and fertility. Thus RDP may lead to improved child health and greater household livelihood security, as well as it may modify desired family size.

In the following sections, each dimension of health and well-being is described in terms of a number of hypothesized pathways. While these pathways are presented in a manner that suggests that they have mainly positive influences, it is also possible that these pathways may be associated subsequent negative effects. In this respect it is important to consider possible barriers and constraints to improvements in health and well-being. For example, changes in village power relations and values are known to provoke strong reactions from Islamic leaders, patrons, landowners and many others who have a vested interest in the status quo. It is quite possible that such reactions to the BRAC programme may negatively affect women's lives and their well-being.

Quite apart from BRAC's socioeconomic development interventions, other background factors influence the direction, velocity and nature of possible pathways of changes in well-being. For example, urbanization (Islam 1990), modernization and the diffusion of new ideas, sectoral transformation (Osmani 1990), and increasing poverty (Rahman and Huque 1988) are important background processes, which can affect well-being. Regional differences must also be heeded. In Matlab, the provision of intensive western-style health services by ICDDR,B for several decades may influence the operation of BRAC's programmes and their associated outcomes. At the micro-level, differences in individual socioeconomic status, marital circumstances, lifecycle stages, education, skills and other "prior advantages" may also influence pathways of change (Levine *et al.* 1994).

7.2 Achieving Reductions in Morbidity and Mortality

Among the most important proximate determinants of morbidity and mortality decline is a decrease in the incidence of communicable and non-communicable diseases and an accompanying decrease in the severity and duration of illness episodes. It is hypothesized that a reduction in incidence can be mediated through three principal pathways.

The first pathway links decreased morbidity and mortality with an increased utilisation of effective health care services provided by BRAC's PHC and ICDDR,B's MCH-FP programmes. It is hypothesized that preventive health and nutrition programmes, such as the promotion of exclusive breast-feeding from birth to 3-4 months of age, provision of family planning services, immunization, vitamin supplementation, and the installation and use of tube wells and sanitary latrines all may contribute to limiting disease susceptibility and transmission, reducing the severity and duration of morbidity, and decreasing case fatality rates. Mortality decline among infants and mothers is also anticipated as better maternal nutrition and antenatal care ensure healthy foetal growth, proper delivery practices and increased birth

¹ This conceptual framework has been developed by the BRAC-ICDDR,B, research team. Seven teams were formed to generate hypotheses linking the interventions in Matlab (BRAC and ICDDR,B) with different dimensions of human well-being. Figure 3 was arrived at by combining the output of the various teams.

weight (De Vaquera *et al.* 1983). Both BRAC and ICDDR,B programmes also ensure timely referral to tertiary care in the case of life-threatening complications.

A second pathway links credit programmes and other income generating activities to an overall improvement in household socioeconomic status. Greater available household income may contribute to better environmental conditions within the household, permit greater spending on curative illness episodes and preventive health, improve food supply and nutrition, and increase access to and use of good quality health care services provided by BRAC and ICDDR,B, together with those provided by government, non-government and private services. It is hypothesized that these income effects will enable earlier illness detection and management, timely referral, improved nutritional status and higher coverage of preventive health care services.

The third pathway links the psychosocial and human capital benefits of functional education, training, and economic activity, to an improvement in women's social and economic status, and ultimately to improved health status. In view of evidence that women tend to allocate a large share of their income to meet the health and nutritional needs of household members, especially children, (Blumberg 1976; Guyer 1980), it is hypothesized that participation in RDP will benefit households by increasing women's ability to respond to illness episodes and management of severe illness within the family. Reduced gender disparity, improved husband-wife communication, and greater female participation in household decision-making may occur as women assume control over their lives and resources. Such processes may lead to improved health and well-being. It is also anticipated that the effects of improvements in status, self-worth, confidence and agency that women acquire as a result of their involvement in economic activity may positively influence other aspects of their lives. In terms of health behaviour, such improvements in psychosocial attributes could enable women to more competently manage health care and prevention at home, as well as enhance their ability to access and interact with the formal health care system.

It should be noted that nutritional status is a critical intermediate variable in all three of the above pathways. Numerous studies have also confirmed the importance of improved nutritional status, particularly for severe protein calorie malnutrition, for better cellular immunity (Kielmann *et al.* 1976; Sinha and Bang 1976), and reductions in morbidity (Tomkins *et al.* 1989) and mortality (Chen *et al.* 1980; Heywood 1986). Micronutrient deficiencies, such as Vitamin A, are also associated with an increased risk of infection and mortality (Sommer *et al.* 1983, 1984; Gopalan 1986). Through their influence on nutritional status, it is hypothesized that BRAC interventions on nutrition education, home gardening, promotion of breast-feeding, safe weaning practices, and Vitamin A supplementation will all lead to declines in both morbidity and mortality.

7.3 Improving Nutritional Status

Three proximate determinants for improving nutritional status are hypothesized, which are the effects of birth weight, food intake (breast-feeding and weaning practices as well as diet quality and quantity) and morbidity. These three represent the end points of four pathways of change. The first pathway is mediated through low birth weight, which increases the susceptibility of infants to infection, severe malnutrition and mortality (De Vaquera *et al.* 1983; Mertens *et al.* 1987). The emphasis of BRAC's PHC and ICDDR,B's MCH-FP on better maternal nutrition, antenatal care and immunization is intended to ensure optimal foetal growth and to reduce the risk of low birth weight.

Another two pathways are mediated through the proximate determinants of food intake. The second pathway is based on the BRAC PHC and ICDDR,B MCH-FP programmes that include health and nutrition education, promotion of exclusive breast-feeding until 3-4 months of age, education of mothers in the preparation of energy dense weaning foods, and the production and consumption of green leafy vegetables and yellow fruits. In the case of BRAC VO members, the actual implementation of these educational messages is facilitated through various sector programmes under RDP, such as vegetable gardening, poultry and livestock production, and fisheries, which can be used to supplement household diet.

The third pathway that could facilitate an improvement in nutrition is increased household income as generated by participation in savings and credit groups and other sector programmes. With an increase in disposable income, it is hypothesized that the proportion spent on food will also increase, thereby enhancing the quality and quantity of the household diet and thus the nutritional status of household members.

The fourth and final pathway links improved nutritional status to a decline in the incidence and severity of illness episodes. Prospective studies of morbidity in children have identified certain infections as important causes of poor growth--most notably diarrhoea, respiratory infections and malaria (Rowland *et al.* 1977). Through the pathways already described for morbidity and mortality, it is hypothesized that nutrition will improve as periods of illness-associated anorexia; impaired intestinal absorption and exogenous nutrient loss diminish in frequency and duration. A decrease in the incidence and duration of diarrhoeal disease is expected to have the largest effect on improving nutritional status.

It is conceivable, however, that BRAC facilitated socioeconomic development may also have negative effects on the nutritional status of young children. Women's participation in employment and other activities may involve leaving the supervision of small children to other caretakers less able to respond to their particular nutritional needs, such as for breast-feeding or the preparation of energy dense weaning foods (Carloni 1984; Popkin and Solon 1976). The possibility of such negative effects also needs to be kept clearly in mind during studies that explore such pathways of change.

7.4 Control of Human Fertility

It is hypothesized that the BRAC RDP might reduce reproductive fertility through four principal pathways. The first and principle pathway links changes in fertility with increased access to and utilisation of family planning, which could facilitate declines in family size, improved birth-spacing and delays in childbearing. Greater use of family planning services may result from BRAC and ICDDR,B programmes and to the greater mobility and autonomy of women participating in BRAC RDP programmes.

The second pathway stems from parallel improvements in child survival, as a result of primary health care programmes, including immunisation, other preventive health services and nutrition education, all of which aim to reduce the need and desire for "replacement" or "insurance" children (Preston 1988), erode fatalism and encourage prolonged use of family planning. At a physiological level, a reduction in perinatal infant deaths may also result in increasing periods of lactational amenorrhea, and hence a lengthening of intervals between births.

A third hypothesized pathway links declines in fertility with associated changes in the status, role and autonomy of women participating in BRAC programmes. With increased decision-making power within the household, women may be able to assert their preference for fewer children vis-à-vis their husbands, as well as more confidently access family planning services (Dyson and Moore 1983).

The fourth pathway links the economic benefits of participating in BRAC savings and credit programmes to declines in fertility. By reducing female dependence on the support and protection of men, as well as enhancing the employment and income levels of women, RDP may lessen the perceived need for large families by providing an alternative means of risk aversion and by reducing the reliance on male children for security in old age (Cain 1983, 1986).

However, it is also difficult to separate the effects of BRAC's RDP on fertility from other Bangladeshi population trends, such as increasing age at marriage and declining fertility associated with the demographic transition. Similarly, the rising proportion of families living in poverty, with corresponding increases in the cost of childbearing and rearing, may also partly account for reductions in family size independently of BRAC socioeconomic interventions. Although the confounding effects of these macro-economic and social changes will be difficult to disentangle, this project has the advantage that the study is based on the four cell intervention design.

7.5 Increasing Income and Livelihood Security

Apart from the daily struggle for subsistence, the majority of rural households in Bangladesh routinely face endogenous and exogenous shocks or crises, which threaten their stability and survival. It is hypothesized that BRAC's RDP will increase household income and thus enhance their livelihood and security, by providing greater access to and control over resources, by facilitating the diversification of productive activities and by supporting investment and the accumulation of assets.

Two related pathways are apparent for possible changes in household income. The first pathway depends on participation in RDP VO meetings, functional education, non-formal primary education and training. All these activities help develop psychosocial capacities and vocational and legal skills. These in turn may increase educational and employment opportunities enhance human capital and increase access to and control over wages, land, inheritance and other resources. Higher income levels and greater buffer or coping capacity is expected as RDP members command higher market wages, and/or engage in lucrative self-employment.

The second pathway to greater household socioeconomic security links participation in BRAC credit and sector programmes to productive diversification, as well as investment and asset accumulation. These can help protect households from external and unexpected contingencies; by stabilizing the household's resource base, spreading risk and providing reserves of food, assets and cash which may be accessed in times of need (Swift 1993). Sector programmes such as irrigation also decrease vulnerability by reducing the probability of weather related risks of disaster and cultivation of a winter rice crop lessens reliance on the summer harvest, which is highly prone to flooding.

The research study also has to keep in mind that BRAC membership may result in no measurable change, or even a worsening, in income levels or overall socioeconomic security. It may be that poverty and insecurity are so extreme, or that other non-BRAC socioeconomic pursuits are so

lucrative, that the relative contribution of BRAC programmes is not apparent. It is also possible that unexpected negative effects may occur in a significant proportion of the households.

7.6 Improvements in Women's Lives

Two main pathways have been identified by which BRAC's RDP may lead to an improvement in women's lives. The first pathway relates to the psychosocial benefits of participation in BRAC village organizations. Through functional education and paralegal training it is hypothesized that women gain a greater awareness of gender issues, including their legal rights and a greater understanding of how sociocultural, economic and political forces affect them. It is hypothesized that this knowledge will result in greater self-confidence and an ability to claim their basic human rights. Self-confidence, autonomy and social support may be further strengthened through interactions with other VO members and BRAC workers. These relationships broaden women's social networks, increase their self-assertiveness and encourage them to venture beyond the confines of the household and its patriarchal culture. This psychosocial development process could result in greater self-worth and control over the products of their labour, improved communication skills, and increased influence in household decision making.

The second pathway concerns the more tangible benefits of BRAC's RDP, including the development of vocational skills, credit-assisted self-employment and participation in other sectoral activities. Involvement in such development programmes facilitates independent income generation and increases women's access to and control over productive resources. Not only may women's economic activity positively influence their actual and perceived value and status, it could also make them less vulnerable in the event of household crises and marital disputes (McGuire and Popkin 1990). Credit-assisted self-employment and sectoral development programmes can also provide valuable experience in negotiation and resource management, which also increases the human capital of women and thus leads to a lessening of gender disparities in terms of poverty, health and well-being.

These pathways and their consequences for women's lives are of course contingent on the particular lifecycle stage and socioeconomic circumstances of the woman concerned (Adams and Castle 1994). However, for younger women already shouldering considerable responsibilities for domestic, productive and reproductive work, participation in BRAC programmes may work to jeopardize the health and well-being of themselves and their children. Likewise, improvements in women's autonomy and self-confidence may not be expressed due to conservative family dictates, particularly those of the husband and mother-in-law. Indeed, backlash effects might be experienced in terms of greater domestic violence. This research study will also look for such adverse effects of BRAC's development programmes.

7.7 A Sustainable Environment

It is widely agreed that improvements in environmental conditions are required for better health status and improved well-being. For rural populations such improvements should include at least housing, water supply, sanitation and air quality. Better household and village socioeconomic conditions are also needed if such environmental conditions are to be sustainable.

Two pathways to improved environmental conditions are apparent. The first is a function of the hygiene and sanitation information provided by the BRAC PHC programme, as well as the functional education, NFPE and VO monthly meetings included in RDP. The supply of low-cost materials for the construction of ring slab latrines and tube wells through BRAC also facilitates improvements in household environmental conditions.

The second pathway is related to various sector programmes. Silkworm culture and social forestry programmes contribute to reforestation, reduce soil erosion, and provide valuable fuel and animal fodder. These programmes, along with vegetable gardening, also benefit the environment by increasing biomass.

However, there are potential problems associated with highly intensive systems of agricultural production supported by the BRAC credit and sectoral programmes, such as a loss of resources by soil erosion, over cropping, water-logging, salinization, and the contamination of groundwater by pesticides. Similarly, unless carefully managed, poultry and livestock programmes may contribute to overgrazing and environmental pollution.

Although the importance of achieving sustainable environmental improvements is fully acknowledged, a thorough exploration of these pathways of change is felt to be outside the scope of this present study. It is proposed, therefore, that only limited household studies will be carried out to examine this area.

8.0 Research Proposals for Phase II: 1996-2000 AD

Informed by the baseline and exploratory studies described above, proposals for Phase II incorporate two main elements:

1. The first consists of large scale surveys to determine the impact of the BRAC and ICDDR,B programmes on improving health status and human well-being;
2. The second focuses on exploring and validating the hypothesised pathways for changes in morbidity and mortality, nutritional status, fertility, income and livelihood security, the quality of women's lives and some aspects of the household environment.

Both qualitative and quantitative methods will be used to investigate the hypotheses outlined previously. However, as the research proceeds, additional or alternate methods may be adopted to investigate new questions and hypotheses as they become apparent. Some studies will be repeated over the project cycle to capture seasonal variations over time, while others will be undertaken periodically or continuously. The original four cell common sampling frame will permit the sharing of variables and qualitative insights between the different research studies, as it is expected that considerable overlap

will exist between the various pathways of interest.

8.1 Study Design

The four cell design enables various combinations of programme inputs to be studied for their impact on health status and well-being. However, for such programmes to achieve their predicted effects they need to be of high quality have sufficient coverage of BRAC eligible households and be implemented for over a long enough period of time.

The four cell study design can be represented as follows:

A0 MCH-FP+RDP At	B0 MCH-FP Alone Bt
C0 RDP Only Ct	D0 No Interventions Dt

The 'A', 'B', 'C' and 'D' represent outcome measures in the four study cells and the suffixes refer to time period – '0' being the beginning time and 't' after time period 't'.

It is clear that this design provides opportunities for many inter-cell comparisons of the outcome measures, both by using cross-sectional and longitudinal designs. Some of the possibilities are illustrated as follows:

A_t vs. B_t	Effect of BRAC RDP in the presence of MCH-FP at time t
$(A_0$ vs. $A_t)$ vs. $(B_0$ vs. $B_t)$	Effect of BRAC RDP in the presence of MCH-FP over time
A_t vs. C_t	Effect of MCH-FP in the presence of BRAC RDP at time t
$(A_0$ vs. $A_t)$ vs. $(C_0$ vs. $C_t)$	Effect of MCH-FP in the presence of BRAC RDP over time and similarly,
A_t vs. D_t	Effect of combined MCH-FP+BRAC RDP at time t
B_t vs. D_t	Effect of MCH-FP alone at time t
B_t vs. C_t	Relative effects of MCH-FP compared with BRAC RDP at time t
C_t vs. D_t	Effect of BRAC RDP compared to no BRAC at time t

Phase II of the Matlab Joint Project will include a wide variety of activities. The following Table 1

below presents a summary of the activities to be pursued during this phase, together with other relevant information.

Demographic Surveillance System (DSS)

This is an ongoing activity of ICDDR,B which registers demographic events such as, birth, death, marriage, divorce, and migration through fortnightly house to house visits by field workers. This will enable us to have the accurate numerator and denominator for calculating demographic rates in any particular point in time. The unique identification numbers assigned to every individuals in the study area by the DSS are used to link individuals with their past and future demographic events, programme participation, and other characteristics measured under different studies. The system will also be in place as it was during the Phase I of the present project.

Table 1. Major Activities

	Activities	Variables	Frequency	Sample
1	Demographic Surveillance System (DSS)	births, deaths, migration, marital status	monthly	all DSS area households
2	Rural Development Programme (RDP) Management Information System (MIS)	major RDP inputs including loan disbursement and repayment, type of income generating activities, school enrollment, savings, training	monthly	all BRAC eligible RDP area households
3	DSS-MIS link	as in (1) and (2) above	monthly	RDP member households
4	Case tracking	use of loan, profit and its use, decision making	monthly	100 loanees in each cell
5	a) Annual child health survey; b) Annual adult health survey; c) Annual household survey.	a) immunization coverage among children <5; b) acceptance of family planning, and tetanus toxoid; prevalence of reproductive tract infection and iron deficiency among women; c) current educational and occupational status, sanitation.	annually, mid-term, and end of project	a) 100 children <5 years; b) adult household members related to a); c) household members related to a).
6	a) Seasonal maternal and child health survey; b) Seasonal household socio-economic status survey; c) Seasonal socioeconomic conditions	a) sickness and its care; anthropometry; dietary quality; b) hygiene; food security; income; expenditure; employment; loans; asset accumulation; crises; c) wage and interest rates; prices; general calamities.	seasonal	a) 1000 children <5 years and their mothers in each cell; (anthropometry in 500 households in each cell) b) households and household members related to a); c) villages related to a)
7	In-depth studies	a) qualitative and participatory investigations of changing women's status and village power relations as well as other issues identified in the course of research. b) dietary intake (quantity);	a) seasonal	a) subsample of children under five in each cell; b) one village in each cell.
8	Final impact survey	same as original baseline survey carried out in 1992	1998	same as for original baseline survey

Rural Development Programme Management Information System (RDP MIS)

This is also an ongoing activity of BRAC. As a regular practice BRAC keeps record of their members and the development inputs the members receive from BRAC. This activity will also continue during the second phase of the project.

DSS - MIS Link

The linking of the BRAC members with the DSS is needed for comparing demographic behaviour between BRAC members and non-members in a prospective fashion. This enables the researchers to

study the demographic impact of the BRAC's and ICDDR,B's programmes jointly and independently. This activity was in place during phase I and will also be continued during the second Phase of the project.

Case Tracking

Under this topic a small number of BRAC members and non-members will be followed continuously to study the process of joining or not joining BRAC and the consequences of BRAC's membership. During the first phase instruments to do this have been developed. These will be applied during the second phase.

Periodic Surveys

These surveys aimed at documenting the status of BRAC member and non-member households mainly in terms of health status and health related behaviour, household environment, family planning acceptance, income, expenditure and savings, and education and occupation. Findings from these surveys will document changes with respect to the above factors among BRAC members and non-members. As can be seen in Table 1, the frequency of data collection will vary depending on the nature of indicators.

In-depth Studies

A number of small scale in-depth qualitative studies will be carried out during the second phase of the project. These studies will mainly focus on changes in women's lives and village power relations due to BRAC's intervention. An outline of such studies can be seen in Appendix II.

Final Impact Survey

This will be a repetition of the baseline survey carried out in 1992 before BRAC started its programme in Matlab. The study will provide an opportunity to measure changes after five years of the development programmes. The study will be carried out in the same 60 villages included in the baseline survey.

8.2 Study Methods

In each study module data collection will involve a mixture of qualitative and quantitative methods, including survey techniques, focus groups, participatory methods, in-depth and key informant interviews, and observational techniques, as determined by the particular pathway(s) or outcome(s) of interest (Fielding and Fielding 1986; Brannen 1992; Stange *et al.* 1994). The periodicity of various methods will also vary. For example, the 1993 baseline survey will be repeated in 1998 in order to assess change in selected impact indicators of health status and human well-being. Seasonal panel surveys of nutritional status, morbidity, sickness care, and income and livelihood-related variables will be undertaken to capture possible changes over time at individual, household and community levels. The proposed seasonal surveys will be timed to capture pre and post harvest situations in the three crop seasons. To clarify health seeking and other behaviours, special studies will be done on a relatively small number of households reporting recent morbidity episodes.

As examples of the conceptual framework and analytical approaches being proposed, Appendix II outlines the hypotheses and studies on possible declines in mortality and on improvement in women's lives.

Other variables will be assessed continuously. Case-tracking or the continuous monitoring of a small sample of individual women will continue through Phase II and this should facilitate the in-depth investigation of loan use and performance, economic reasoning, health decision making, resource and time allocation (Pelto 1992). Case-tracking will also provide insight into more subjective variables, such as feelings of confidence and self worth and their evolution over time. These case studies will serve as a means of placing issues of health and household livelihood in the actual context of women's lives. Mortality, fertility and migration will also be continuously monitored as a part of ICDDR,B's DSS.

8.3 Sampling Strategy

In Phase II, all research modules will use a standard sampling frame in which all four cells of the baseline survey design are represented. A consistent sampling frame will permit the linkage of variables between research modules. The precise sample size (i.e. the number of study households, or individual respondents) will depend on the nature of the questions and variables being investigated and the methods to be used. For example, the study of mortality changes may necessitate a large sample that includes all eligible individuals in the four study cell populations. The assessment of changes in child nutritional status, on the other hand, will require fewer numbers from each of the four cells. In-depth studies of dietary intake, and ethnographic investigations of power relations or household decision making will involve even fewer numbers.

The actual sample size for the households included in the first baseline survey varied among the four cells, with the highest number in the BRAC-MCH-FP cell and lowest in MCH-FP only cell. Sample size calculations for most of the variables of interest (with the exception of mortality) indicate a minimum sample size of 1000 households to capture acceptable levels of significance. Thus, for annual and seasonal surveys a total of 1000 households will be sampled and interviewed in each cell. For operational convenience, this sample will be selected from a smaller number of baseline villages that have been identified in advance. In-depth studies will be confined to one village from each cell, which includes Uddamdi village where the project research station is located.

8.4 Management Information System (MIS)

In order to monitor the RDP programme inputs, information and data are being recorded on such activities as savings, loans and loan repayments, income generating activities, school enrollment, and school and VO meeting attendance. This is an ongoing part of RDP's management information system (MIS).

Selected information on RDP inputs are normally processed through the RDP MIS located in Dhaka. For the purposes of the joint project, a computer-based MIS has been installed in Matlab which links the data collected at the household level by ICDDR,B's DSS and Record Keeping System (RKS) with RDP information on such items as savings, loans and loan repayment, income generating activities, VO participation, school enrollment and attendance. Consulting the DSS family registers of RDP members,

and noting their DSS identification number. During Phase II, the project database will be expanded to include DSS, RKS, RDP, baseline, KAP surveys in Matlab and prospective data on programme inputs for the entire sample of RDP members and non-members. This will be done by linking the BRAC MIS with DSS and RKS flat files, and will not entail any new data collection and entry. It may be mentioned that the RKS is operated only in the MCH-FP area and covers only a selected number of variables of interest to the BRAC-ICDDR,B project. However, attempts will be made to make the best use of available RKS data to compare the BRAC members and non-members within the MCH-FP area. In the future if the RKS is extended to the comparison area, the project will make the best use of the data collected through RKS. Every effort will be made to avoid duplication in data collection and entry.

8.5 Management, Scientific Guidance and Capacity Development

As in Phase I, the project will be managed by two principle investigators, one from both BRAC and ICDDR,B, who are Dr. Mustaque Chowdhury and Dr. Abbas Bhuiya respectively. Regular research review meetings will facilitate skills development, exchange of data and the development of insights into how the findings might be interpreted. While the initial focus will be on theory building and the development of research methods, later meetings will focus on data analysis and interpretation of the findings. Review meetings will be attended by the entire research team, and facilitated by senior researchers and project advisors.

The two-member steering committee consisting of the BRAC and ICDDR,B Directors will continue to oversee and steer the project. The management committee will be reconstituted as advisory committee, in view of the fact that the research project is now well accepted within both organisations. The advisory committee will include the following:

From BRAC: Salehuddin Ahmed, PhD - Director Programmes; Aminul Alam, MSc - Director Field Operations (RDP); and Mustaque Chowdhury, PhD - Director Research and Evaluation, and Co-principal Investigator.

From ICDDR,B: Professor Patrick Vaughan, MD - Director, Community Health Division; Jeroen van Ginneken, PhD - DSS Project Director; and Abbas Bhuiya, PhD - Social Scientist and Co-principal Investigator.

The project has recruited some experienced and well motivated young Bangladeshi staff, some have gone abroad for higher studies and, hopefully, will return to the project upon completion of their studies. However, since there is still a need for research professionals with relevant experience and qualifications, the project will recruit more senior level researchers in order to provide scientific guidance to younger team members. Moreover, the project has established contacts with overseas university departments and is hoping to attract promising post-doctoral staff to the project on a longer term basis. Contacts will also be established with institutions in the Asia region.

8.6 Scientific Output and Evaluation

The project will make significant scientific contributions on the relationship between development studies, health and well-being. It will help in better understanding of the interactions between development inputs and their impacts in relation to poverty alleviation and empowerment of women.

Such an understanding of the mechanisms of the impact will help fine-tune programme inputs and strategy towards improved and effective programming. Specific research outputs will include working papers, papers in national and international journals and presentations in scientific gatherings. An international conference on the theme of the project is being planned for the end of the project period.

The last external review of the project was carried out in January 1995 (see Appendix I for the executive summary of the review). Two further reviews are proposed during Phase II, the first in 1998 and the final one in the year 2000 AD.

No substantive risks are envisaged for the project, apart from the possible discontinuation of either of the organizations, and/or undue disruption due to excessive political activities or natural disasters. However, even if these were to occur both BRAC and ICDDR,B have credibility, a solid reputation, and the scientific capacity to continue their work, even in the face of such events.

8.7 Timetable of Activities

Because of the nature of the issues being addressed by the project, Phase II is planned for five years beginning 1996. A timeline for major planned activities is presented in Table 2 below. As can be seen in the timeline the project will take two “pauses” in data collection during the five year project period: one in 1996-97 and other in 1998-99. These pauses will be used to analyze and review the data collected and to plan for future studies. This project period will conclude with an international conference to discuss results of the project in the year 2000.

Table 2. Time Schedule of Major Activities

Activities	1995	1996	1997	1998	1999	2000
Demographic Surveillance System (DSS)	XXX	XXX	XXX	XXX	XXX	X
Rural Development Programme – Management Information System (RDP-MIS)	XXX	XXX	XXX	XXX	XXX	X
DSS-MIS Link	XXX	XXX	XXX	XXX	XXX	X
Case Tracking	XX	X	XX	X	XX	X
Seasonal/periodic survey	XX	X	XX	X	XX	X
In-depth studies	XX	X	XX	X	XX	X
Final Impact Survey				XX		
Analysis	XXX	XXX	XXX	XXX	XXX	XXX
Workshop		X		X		
Conference						X
Review				X		X

X - Refers to a four month period

X - Exclusive attention to analysis

9.0 Bibliography

Adams A.M. and Castle S.E. (1994) Gender relations and household dynamics. In: *Population Reconsidered: Health, Empowerment and Rights* (edited by Sen G., Germaine A. and Chen L.) Cambridge MA: Harvard Center for Population and Development Studies.

Adams A.M., Das Roy R., Mahbub A. (1993) Participatory methods to assess change in health and women's lives: an exploratory study for the BRAC-ICDDR,B Joint Project in Matlab. *BRAC Working Paper Series*, Bangladesh Rural Advancement Committee, Dhaka, Bangladesh.

Bangladesh Bureau of Statistics (1991) Report of the child nutritional status survey 1989-90.

Bangladesh Bureau of Statistics (1991) *Statistical Pocket Book of Bangladesh*. BBS, Dhaka, Bangladesh.

Bhuiya A. and Chowdhury (1992) Impact of social and economic development programmes on human well-being: a collaborative project in Matlab, Protocol no. 92-028, ICDDR,B, Dhaka.

BRAC (Bangladesh Rural Advancement Committee) (1994) *Annual Report 1993*. BRAC, Dhaka, Bangladesh.

Black R.E., Brown K.H., Becker S. (1984) Malnutrition is a determining factor in diarrhoeal duration, but not incidence, among young children in a longitudinal study in rural Bangladesh. *American Journal of Clinical Nutrition* 39(1):87-94.

Blumberg R.L. (1976) Fairy tales and facts: economy, family fertility and the female. In: *Women and World Development* (edited by Tinker I., Bransen M.B. and Buvinic M.). New York: Praeger:12-21.

BRAC ICDDR,B (1994) *Socio-economic development and health-a joint BRAC-ICDDR,B research project: baseline survey, Matlab, 1992*. BRAC-ICDDR,B Working Paper Series.

Brannen J (ed) (1992) *Mixing Methods: Qualitative and Quantitative Research*. Avebury, Brookfield USA.

Briend A., Wojtyniak B., Rowland M.G.M. (1988) Breast feeding, nutritional state, and child survival in rural Bangladesh. *British Medical Journal* 296(6626):879-882.

Cain M. (1983) Fertility as an adjustment to risk. *Population and Development Review*, 9(4):688-702.

Cain M. (1986) Risk and fertility; a rejoinder. *Population Studies*, 299-304.

Caldwell J.C. (1979) Education as a factor of mortality decline: an examination of Nigerian data. *Population Studies*. 33(3): 395-414.

Caldwell J.C., Reddy P.H., Caldwell P. (1985) Educational transition in rural South India. *Population and Development Review* 11: 29-51.

- Caldwell J.C. (1986) Routes to low mortality in poor countries. *Population and Development Review* 12: 171-214.
- Carlioni A.S. (1984) *The impact of maternal employment and income on the nutritional status of children in rural areas of developing countries: what is known, what is not known, and where the gaps are*. Rome: Food and Agriculture Organization.
- Chen L.C., Chowdhury A., Huffman S.L. (1980) Anthropometric assessment of energy protein malnutrition and subsequent risk of mortality among preschool aged children. *American Journal of Clinical Nutrition* 33:1836-1845.
- Chen M. and Mahmud S. (1993) Assessing Change in Women's Lives: A Concept Paper for BRAC-ICDDR,B Collaborative Research.
- Chen M., Chen L.C., Mahmud W. and Peltó P. (1995) BRAC-ICDDR,B Collaborative Research Project: Mid-term Review. BRAC-ICDDR,B, Dhaka.
- Chowdhury MRK (1994) Proceedings of a Workshop on Research Framework. BRAC-ICDDR,B, Dhaka.
- Cleland J.G. and Ginneken J.K. (1988) Maternal education and child survival in developing countries: the search for pathways of influence. *Social Science and Medicine* 27(12): 1357-1368.
- De Vaquera, Martha V., Townsend, J.W., Arroyo J.J., Lechtig A. (1983) The relationship between arm circumference at birth and early mortality. *Journal of Tropical Pediatrics* 29:167-174.
- Dyson T. and Moore M. (1983) Kinship structure, female autonomy and demographic behaviour in India. *Population and Development Review* 9: 35-60.
- Fielding N.G. and Fielding J.L. (1986) *Linking Data: Qualitative and Quantitative Research Network Series 4*. Sage Publications, London.
- Gopalan C. (1986) Vitamin A deficiency and child mortality. *NFI Bulletin* 7:6-7.
- Guyer J.L.(1980) Household budgets and women's incomes. Working Paper no. 28. Brookline, MA: African Studies Center, Boston University.
- Heywood, P.F. (1986), Nutritional status as a risk factor for mortality in children in the highlands of Papua New Guinea. In: *Proceedings of the XIII International Congress of Nutrition*, edited by Taylor, T.G. and N.K. Jenkins. London: John Libbey Inc., p. 103-106.
- Hogendorn J.S. (1992) *Economic Development*. Harper Collins Publishers, Ltd., New York.
- Islam N. (1990) Sector paper on human settlements and urban development, Dhaka, IVCN/BARC.
- Kannan K.P., Thankappan K.R., Raman Kutty V., Aravindan K.P. (1991) *Health and Development in*

Rural Kerala: A Study of the Linkages between Socio-economic Status and Health Status. Integrated Rural Technology Centre of the Kerala Sastra Sahitya Parishad, Kerala, India.

Kielmann A.A., Uberoi I.S., Chandra R.K., Mehra V.L. (1976) The effect of nutritional status on immune capacity and immune responses in preschool children in a rural community in India. *WHO Bulletin* 54:477-483.

Koenig M.A., Phillips J.F., Simmons R., Ali Khan M. (1987) Trends in family size preference and contraceptive use in Matlab. *Studies in Family Planning* 18(3): 117-127.

Levine R.A., Levine S.E., Richman A., Tapia Uribe Medardo F., Correa C.S. (1994) Schooling and Survival: The Impact of Maternal Education on Health and Reproduction in the Third World. In: *Health and Social Change in International Perspective* (edited by Chen, L.C. *et al.*) Cambridge: Harvard University Press: 303-339.

Lovell C.H. *Breaking the Cycle of Poverty: The BRAC Strategy* (1992) Kumarian Press, West Hartford, Connecticut.

Mahmud S. and Chen M. (1993) Assessing change in women's lives: Concept paper for the BRAC-ICDDR,B Collaborative Research Project, BRAC-ICDDR,B Joint Project, Dhaka.

McGuire J. and Popkin B. (1990) Beating the zero sum game: women and nutrition in the third world. In: *Women and Nutrition*. Nutrition Policy Discussion Paper No. 6. UN Administrative Committee on Coordination-Subcommittee on Nutrition, 11-66.

Mertens T.E., Cousens S.N., Feachem R.G. (1987) Evidence of a prolonged association between low birth weight and paediatric diarrhoea in Sri Lanka. *Trans Royal Soc Trop Med Hyg* 81:196.

Mitra S.N., Lerman C., Islam S. (1992) *Bangladesh Contraceptive Prevalence Survey 1991: Key Findings*. Mitra and Associates, Dhaka, Bangladesh.

Osmani S.R. (1990) Structural change and poverty in Bangladesh: the case of a false turning point, *Bangladesh Development Studies*, 18(3).

Pelto 1992. Appendix 4: Some models for qualitative research appropriate for the BRAC-ICDDR,B collaborative project. In: Report of the Expert Committee Meeting on the BRAC-ICDDR,B Collaboration in Matlab, 15-22 June, Dhaka, Bangladesh, 1992.

Popkin B.M. and Solon F.S. (1976) Income, time, the working mother and child nutrition. *J Trop Pediatr Environ Child Health* 22:156-166.

Preston S.H. (1988) *The effects of infant and child survival on fertility*. New York: Academic Press.

Rahman A. and Huque T. (1988) Poverty and inequality in Bangladesh in the eighties: an analysis of some recent evidence, Research Report No. 91, Dhaka: Bangladesh Institute of Development Studies.

Rosenfield P.L. (1992) The potential of transdisciplinary research for sustaining and extending linkages between the health and social sciences. *Soc.Sci.Med.* 35(11): 1343-1357.

Rowland M.G.M., Cole, T.J., Whitehead R.G. (1977) A quantitative study into the role of infections in determining nutritional status in Gambian village children. *British Journal of Nutrition* 37:441-450.

Scott I., Evans T.E., Cash R. (1993) Unpacking the Black Box: A Concept Paper for BRAC-ICDDR,B Collaborative Research in Health.

Sinha D.P. and Bany F.B. (1976) Protein and calorie malnutrition, cell mediated immunity and BCG vaccination in children from rural West Bengal. *Lancet*.2:531-534.

Sommer A., Tarwotjo I., Hussini G., Susanto D. (1983) Increased mortality in children with mild vitamin A deficiency. *Lancet* 2:585-588.

Sommer A., Katz J., Tarwotjo I. (1984) Increased risk of respiratory disease and diarrhoea in children with pre-existing mild vitamin A deficiency. *American Journal of Clinical Nutrition* 40:1090-1095.

Stange K.C., Miller W.L., Crabtree B.F., O'Connor P.J., Zyzanski, S.J. (1994) Multimethod Research. *J. Gen. Int. Med.* 9: 278-282.

Swift J. (1993) Understanding and preventing famine and famine mortality. *IDS Bulletin* 24(4):1-16.

Tomkins A., Dunn D.T., Hayes R.J. (1989) Nutritional status and risk of morbidity among young Gambian children allowing for social and environmental factors. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 83:282-287.

Townsend P. and Davidson N. (eds) (1982) *Inequalities in Health: The Black Report*. Penguin Books, London.

United Nations Development Programme (1991) *Human Development Report 1991*. Oxford University Press, Oxford.

United Nations (1986) Education and fertility: selected findings from the World Fertility Survey data. United Nations Population Division Working Paper.

World Bank (1988) Bangladesh: a review of selected issues in education, Report No 6770-BD.

World Bank (1994) *World Development Report 1994: Infrastructure for Development*. Oxford: Oxford University Press.

APPENDIX - I

Executive Summary of the Midterm Review of the BRAC-ICDDR,B Project

During the period January 18-February 1, 1995, a four-person external scientific team was commissioned by BRAC and ICDDR,B to undertake a mid-project review of the “BRAC-ICDDR,B Collaborative Research Project.” Over the course of the four days, the team members participated in seminar presentations by BRAC-ICDDR,B researchers; reviewed research design, plans, and papers; conducted detailed research discussions with Project scientists; and presented its findings and recommendations to the directors of BRAC and ICDDR,B and their staffs.

Overall, the team concluded that considerable preparation and hard work have been invested by Project scientists in the research design, baseline survey, initial papers, and future research plans. The project holds great promise for pathbreaking research on the outcomes and processes of rural development interventions on health, nutrition, reproduction, and the quality of life of low-income women and their families in the study villages of Matlab thana. Distinctive is the remarkable scientific collaboration that has matured between a Bangladeshi NGO (BRAC) and an international research center (ICDDR,B), facilitated by the trust and cooperation between the two institutional directors and the two research directors.

Pathbreaking research has already begun. It could be enhanced in several areas. A unique opportunity, for example, exists to understand changes in women’s knowledge, economic security, and power with the introduction of BRAC’s RDP. Economic studies can delineate how credit and services empower the poor, especially women, to improve the income of women and their families. Qualitative studies can advance understanding of the social processes by which socioeconomic interventions improve health seeking behaviour, dietary practices and nutritional status, and reproductive performance. The introduction of BRAC’s RDP into both the ICDDR,B’s MCH-FP and comparison populations provides a 4-cell study design that could advance understanding of how changes in “demand” factors (rather than simply “supply” factors) can influence reproduction in rural Bangladesh. Properly and successfully pursued, the BRAC-ICDDR,B Project can powerfully contribute to development policy in Bangladesh and beyond.

Several major areas of concern, however, were also identified. The Project is extremely ambitious. Many disciplines must be harnessed, and there is virtually an unlimited range of potential studies. Selection, focus and quality, therefore, will be required, necessitating discipline, concentration, and the judicious deployment of limited scientific resources. The sheer scale of data collection could overwhelm the equally challenging tasks of hypothesis formulation, data analysis, and scientific report writing and dissemination. Indeed, the current Project balance is skewed toward excessive data collection and insufficient analysis.

To maintain Project momentum, we recommend that balance and focus should be introduced into the 1995 workplans. The planned quarterly/annual surveys should be executed but significantly streamlined. Qualitative studies, a critical yet under-invested component, should be launched. BRAC’s RDP should be expanded in the Matlab area to increase the population sizes of the two new

cells. The trade-off between systematic linking of the DSS data set versus data cleaning for targeted research should be carefully weighed so that sufficient time is available for research rather than simply data management.

To ensure ongoing learning, periodic “pauses” should be introduced to allow researchers to analyze and write-up existing data, to interpret findings, to write-up studies, and to feed back such learning into future data collection. Ongoing external advisory inputs could assist this process, but such should be less episodic or ad hoc. A full-time scientific editor and a full time research manager could free up scientific time of the Project directors and accelerate research output. Research papers could be brought out as part of a working paper series for critical commentary.

APPENDIX - II

PATHWAYS LINKING SOCIOECONOMIC DEVELOPMENT PROGRAMMES TO MORTALITY DECLINE AND IMPROVEMENTS IN WOMEN'S LIVES

A. Mortality Decline

Decreased mortality is an important dimension of human well-being in the overall conceptual framework guiding study design (Figure 2). This module outlines the specific hypotheses, methods and financial budget needed to assess the pathways linking socioeconomic development and mortality in Matlab.

The hypotheses presented here are informed by results from the exploratory phase of the joint project, and by a wealth of related research undertaken by the ICDDR,B over the last two decades. For example, previous studies in Matlab have indicated a significant association between malnutrition, and the duration of diarrhoeal disease and mortality (Black *et al.* 1984; Chen *et al.* 1980). A strong inverse relationship between breastfeeding and child mortality has also been established in Matlab (Briend, Wojtyniak and Rowland 1988). Elsewhere in Bangladesh, an ICDDR,B study in Mirzapur has shown that sanitary latrines, handpumps and hygiene education decrease diarrhoeal morbidity by twenty-five percent. Prior to BRAC's intervention in Matlab, the baseline survey indicated that only 3% of BRAC eligible households possessed sanitary latrines. Baseline results also indicated that the large majority of households (over 95 %) use surface water for cooking and cleaning (BRAC-ICDDR,B 1994).

Objectives

To assess the impact of RDP on mortality and the pathways through which the different components of RDP operate to reduce mortality.

Hypotheses

As shown in Figure 2, mortality is directly and indirectly influenced by BRAC programmes through a web of intersecting pathways related to decreased morbidity and fertility, and improvements in nutritional status, women's lives and income levels. In this module, it is hypothesized that among the most important proximate determinants of mortality decline are decreased morbidity, increased resistance to infection through improved nutritional status, and greater access to health care ensuring timely and appropriate referral and treatment. For each of these proximate determinants, a number of related hypotheses are identified which represent pathways linking BRAC programmes to decreased mortality:

1.0 Hypotheses Related to Decreased Morbidity Incidence and Duration:

1.1 RDP members and their dependents have lower morbidity than non-members:

1.1.1 RDP members have better access to and utilization of safe water (through

the installation of tubewells and/or hygienic storage) than non-members;

- 1.1.2 RDP members have better access to and utilization of safe excreta and refuse disposal systems (through the installation of slab latrines) than non-members;
- 1.1.3 RDP members have better knowledge and practice of personal hygiene than non-members.

2.0 Hypotheses Related to Greater Access to Health Care

2.1 RDP members have greater access to modern health care:

- 2.1.1 RDP members have more knowledge about existing modern health facilities than non-members;
- 2.1.2 RDP members have greater knowledge about preventive health care measures and practices (i.e. immunization, vitamin A and iron-folic supplementation, exclusive breastfeeding and healthy weaning practices, use of ante and post-natal care and trained birth attendants), and assume healthy behaviours and practices more frequently than non-members;
- 2.1.3 RDP members spend more on health care, and utilize modern curative care more often than non-members;
- 2.1.4 In the case of illness, RDP members access health care services earlier and are more compliant with treatment regimes than non-members;
- 2.1.5 RDP members have greater confidence and ability to interact with health care providers (clinic-based and outreach) than non-members;
- 2.1.6 Gender discrimination in preventive and curative health care utilization is less apparent among the RDP member households than non-members.

3.0 Hypotheses Related to Increased Nutritional Status

- 3.1 RDP members and their dependents have better nutritional status than non-members:
 - 3.1.1 RDP members and their dependents have greater knowledge about healthy nutritional practices than non-members;
 - 3.1.2 RDP members have more kitchen gardens than non-members;
 - 3.1.3 The dietary intake of RDP members and their dependents is of greater quality and quantity than non-members;
 - 3.1.4 RDP members and their dependents take nutritional supplements (i.e. vitamin A capsules, iron folic tablets, iodized salt etc.) more frequently than non-members;
 - 3.1.5 Children of RDP members receive better breastfeeding and weaning care than non-members;
 - 3.1.6 Gender discrimination in intra-family food distribution is less apparent among the RDP member households than non-members;
 - 3.1.7 Female RDP members of child-bearing age have less pregnancy complications and greater

birth weight than non-members.

B. Women's Lives

One of the most important objectives of BRAC's RDP is to improve the condition of women's lives, especially from the most disadvantaged segment of the community. BRAC-ICDDR,B joint research in Matlab aimed at studying the impact of RDP and its mechanisms. An assessment of RDP's impact and an understanding of the mechanisms will indicate its effectiveness to fulfill the objectives. Additionally, this will also provide a valuable insight about the strengths and weaknesses of the programme, which can be helpful to improve it further.

Objectives

To assess the impact of RDP on women's lives, and in reducing gender inequality, and the pathways through which the different components of RDP operate to improve the conditions;

Hypotheses related to impact and mechanisms

As shown in Figure 2, RDP may influence various aspects of women's lives through a variety of pathways. A description of the hypothesized pathways can be seen in Section 4.4 of the main proposal. Hypotheses in relation to mortality and health are listed above. The following hypotheses will be tested under the auspices of this module.

I. Hypotheses related to demographic and health benefits:

- 1.1 More gender equity in terms of survival, nutritional status, food intake, sickness care, education, role in household decision-making and allocation of resources will prevail in the family of RDP members than those of non-members;
- 1.2 RDP members will have less number of unwanted pregnancies and children than those of non-members;

II. Hypotheses related to psycho-social benefits of RDP members compare to non-members at various levels:

Individual level

- 2.1 Increased self confidence;
- 2.2 Increased ability to diagnose the local socio-political-economy -- consciousness about local realities;
- 2.3 Reduced dependence on traditional patrons, the elite, or others for decisions, guidance, or conflict resolution;
- 2.4 Increased awareness of status, rights, and exploitation;

2.5 Increased mobility and participation in the public sphere, especially for women;

Family level

3.1 Decreased incidence of dowry;

3.2 Decreased incidence of early marriage;

3.3 Decreased incidence of quick marriage of daughters without knowing the details of the groom;

3.4 Increased registration of marriage;

3.5 Decreased incidence of polygamy;

3.6 Decreased incidence of divorce, abandonment, and separation;

3.7 Increased demand for *mehr* and maintenance in case of divorce;

3.8 Increased claims by women to their share of inheritance;

3.9 Reduced physical violence against women;

4.0 Increased cash earning and spending;

4.1 Increased possession of assets;

4.2 Increased participation in family spending;

4.3 Increased control over own and family resources;

4.4 Increased role in household decision making;

Outside Family

5.1 Increased mobility to go outside village for availing public and private sector services and resources;

5.2 Increased participation in collective women actions.

Methods

Detail of the overall study design can be seen in the main document.

A number of small scale qualitative studies will be carried out to get in-depth information to explain mechanisms of the impact of RDP on women's lives. These studies will heavily draw on the experiences gained through some exploratory studies carried during the first phase both in Matlab and

elsewhere of the BRAC RDP. During the first phase, pilot studies on female headed households and maritally disrupted (divorced, separated, abandoned and (widowed) have been carried out to decide on the methodologies and to know about the nature of problems the most vulnerable women face everyday and their coping mechanism and the role of RDP in catering their needs. In relation to reproductive health, pilot studies on effective knowledge of family planning methods and analyses of induced abortions and (their management have also been made during the first phase. A number of in-depth studies, including one on psycho-social well-being of women, will be carried out during this phase. Results of these studies will be used in formulating questions for the seasonal surveys.

Table AI. Key Variables, Frequency of Data Collection and Sampling Strategies for Assessing Pathways of Change in Mortality

(#)	Variables	Frequency of collection	Sample size
1	Mortality	monthly house to house visits	all persons in the DSS area
2	Weight, height, MUAC	seasonal house to house visits	1,000 under five children and their mothers in each cell
3	Sickness and its care including identity of caretaker and decision maker, types of provider, cost of treatment, and source of money	a) seasonal for 1000 under five children in each cell; b) occasional small scale.	a) same as (2) b) sub-sample of (2)
4	Dietary intake: a) quality; b) quantity.	a) seasonal 24 hour recall; b) seasonal 7-day 24 hour recall.	a) sub-sample of (2); b) sub-sample 25 male and 25 female under five children from each cell.
5	Feeding practice among infants (exclusive breastfeeding, and supplementary feeding)	same as (4)	same as (4)
6	Public health measures: a) EPI acceptance; b) VAC acceptance.	annually	a) subsample of (2) aged 18-23 months; b) subsample of (2) aged 6-59 months
7	Family planning acceptance	annually	c) same as (2), currently married women of reproductive age
8	Education: a) level b) enrollment and attendance c) achievement	a) annually b) annually c) annually	a) persons aged >6 years from the households of (2); b) persons aged 6-15 years from the households in (2).
9	Occupation of head of household and spouse	annually	all head of households and spouses from households of (2)
10	Hygiene behaviour	seasonal	all households in (2)
11	Water and sanitation	annually	all households in (2)
12	Income (major source and type including distress sales)	seasonal	all persons in households of (2)
13	Employment (type)	seasonal	all persons from households of (2)
14	Expenditures (major items including food, clothing, sickness care, education)	seasonal, occasional and small scale	all persons from households of (2)
15	Asset accumulation	seasonal	women from (2) and their households
16	Loans (formal and informal)	seasonal	all persons from households in (2)
17	Macro indicators: a) price of essential goods; b) wage and interest rates; c) natural calamities d) epidemics.	seasonal	a) village markets related to (2) b) villages in (2) c) union and thana health centres related to (2)
18	Women's status and reproductive health	seasonal and occasional in-depth	one village in each cell
19	Village power relations	occasional and periodic in-depth investigation	one village in each cell

APPENDIX-III**List of participants in research design**

Abbas Bhuiya	Gazi Hassan
Gul Rukh Selim	Hasan Zaman
Mahfuzur Rahman Khan	Mehnaz Momen
Monzurul Mannan	Mushtaque Chowdhury
NM Jahangir	Sabah Tarannum
Samiha Huda	Shahed Hussain
Shahriar Reza Khan	Syed Masud Ahmed
Ziauddin Hyder	