Integration of the community based management of acute malnutrition (CMAM) programme into primary health care in Pakistan

The word malnutrition explains both conditions of under or over nutrition, in this text it is used in terms of undernutrition. This intervention explains the direct and indirect effects of maternal and child undernutrition, nutrition related outcomes on the health indices in comparison to the social determinants. A brief background about the history of the Community Based Management of Acute Malnutrition (CMAM) programme and how it was introduced in Pakistan. Throughout the text the effectiveness and developmental capacity of this programme will be justified with examples of successful trials conducted in different developing countries trying to attain the Millinium Developmental Goals 1; eradicating extreme poverty and hunger, 4; reduce child mortality and 5; improve mater health. An impact evaluation of the services provided during emergency phase and how they can support in sustaining the future food insecurities, predicted to escalate as social inequalities will increase due to high rates of urbanisation. The CMAM programme targets; exclusive breastfeeding, initiation of complementary feeding at 6 months, dietary needs of infant and mother with supplementation if undernourished and recommended use of micronutrients. The principal aim is to provide strategies to enhance community and individual health through awareness and mobilization. All the support and endeavours are aimed at reducing the reported childhood illnesses in the region.

Background:

Pakistan being a developing country is still in the process of learning from others’ mistakes and finding sustainable solutions to present and future problems. Despite of an established health care system and striving human resource it constantly faces natural calamities in form of earthquakes and persistent floods enhancing health issues. The (CMAM) programme was introduced following 2005, earthquake and implemented in 2007-2008. The final protocols and national guidelines for the management of acute malnutrition amongst children under five, pregnant and lactating women was established with the support of the United Nations Children’s Fund (UNICEF) and World Health Organization (WHO) recommendations in 2010 after the 2010 floods (United Nations, 2007).
The CMAM programme was already introduced in different parts of the African sub-continent and initial trials were conducted in Bangladesh on integrated management of childhood illnesses (IMCI) since 1990’s to treat under 5 children for diarrhoea, pneumonia, malaria, measles, and malnutrition (Arifeen, et al., 2009). The Community based Therapeutic Care (CTC) is provided for severe acute malnourished (SAM), moderately acute malnourished (MAM) children and pregnant lactating women (PLW). Provided with ready to use therapeutic foods (RUTFs) based on the anthropometric measurements, mid-upper arm circumference (MUAC), oedema, height for age Z-score (HAZ), weight for Age Z-score (WAZ) and weight for height Z-score (WHZ) (WHO, 2006; Lapidus, et al., 2009). Undernourished children and women enrolled, receive routine medication for IMCI as per the national protocols and treatment guidelines (Collins, et al., 2006; United Nations, 2007; Acute, Briend and Collins, 2010).

After 2010 floods the CMAM programme was piloted with support of UNICEF, WHO, World Food Programme (WFP) and their implementing partners’ (International Non-Governmental Organizations (INGOs) and Local Non-Governmental Organizations (NGOs)) in the flood affected districts of Punjab, Sindh and some parts of North West Frontier Province (NWFP). Initially implementing partners were to train teams on the CMAM programme, by capacity building of Ministry of Health Pakistan (MOH) staff for a period of one year. The MOH was expected to implement the programme effectively.

The CMAM programme:

**Figure: 1** Community presentation in terms of Nutritional status **Moderate > Severe > Complications**
Describing basics model of the CMAM programme, Figure: 1 represents the prevalence of malnutrition according to its types in the community. Moderate malnutrition has been the most common and severe malnourishment is less prevalent. Research has shown, if under nutrition is not treated timely, that may result in to acute under nourished presents as wasting in children categorized as SAM, MAM and chronic under nourished presenting as stunting in children (UNICEF and WHO, 2007).

This programme is a community based public health approach to treat malnutrition, benefiting individuals and population. It aimed to reduce opportunity costs of treatment, for families and developing family/community coping mechanism. By developing improved access (decentralised approach) to health, creating liaison within the community for better case coverage and early detection of undernourished (proportion of diseased subjects receiving targeted care and the rest of the community receive timely awareness).

For the successful and proper implementation, the CMAM programme provides decentralised care (access) in the community by targeting homes, reducing barriers, increasing community sensitization and mobilization acknowledging the cultural norms.

It is designed to provide coverage for 70% population in the catchment area, by community sensitization. Supported by trained birth attendants (TBAs), lady health workers (LHWs), community health workers (CHWs), out-reach workers, union council (UC) chairmen, in schools and individual participation delivering maximum impact and saving lives.

Timely presentation of undernourished cases for treatment can be obtained by community awareness and active case finding. Early treatment can reduce the chances of developing complications and severity. With effective compliance 90%, children and pregnant women can be treated as outpatients if detected and treated earlier.

Figure: 2, Causes of Malnutrition

Appropriate care in the CMAM programme targets breastfeeding, immunization, nutrition, and hygiene and sanitation education at community and individual levels by culturally appropriate means. The type of care provided is according to the severity, appropriate referral for concomitant illness provided through WHO and UNICEF causal framework (Smith and Haddad, 2000). Figure: 2, highlights different causes of malnutrition mainly due to different socio and economic factors in our daily life that are targeted by the CMAM programme.

This intervention is designed to ensure that carers understand that undernourished children and pregnant women will receive the treatment until full recovery. Maximum impact of the CMAM programme can be obtained by integrating it with primary health care (PHC). During the piloted programme both the PHC and the CMAM services were managed from basic health units (BHUs) in the rural areas. The programme design ensures the level of the provided care until malnutrition is present in the community.

Pakistan context:

Several CMAM sites are functional in Punjab, Sindh and Khayber Pakhtun khaw (KPK) formally known as North West Frontier Province (NWFP) by MOH. Still the difference between the CMAM programme and CMAM services is not clearly understood. MOH was supposed to run the programme and services effectively by increasing the territories rather than providing services at previous flood affected sites. Many INGOs and local NGOs have phased-out of the region, resulting in closure of several CMAM sites.

The Nutritional Survey conducted by UNICEF, Action Contre La Faim Canada (ACF CA) and MOH, in January 2011 included 1200 households from Punjab province (600 severe and 600 moderately flood affected regions) showed 13.9% (with 95% CI 11.4- 16.9%) global acute malnourishment (GAM), 10.4% (with 95% CI 8.4-12.8%) MAM and 3.5% (with 95% CI 2.3-5.2%) SAM. 28.4% women were pregnant, 72% were already breast-feeding to 6-24 months old children and 11% were taking iron supplementation. Amongst 557 mothers, 35% had MUAC below 21 cm. Lowest MUAC recorded was 17.5 cm and the highest was 38.8 cm in women. The rates of stunting were about 50%. Similarly, stunting and underweight were also very high according to international standards (WHO, 2005). The survey only represented nine districts via cluster mapping method following SMART methodology and SPHERE minimum standards (UNICEF and ACF, 2011; SPHERE project, 2nd edition Geneva, 2004). Despite the small sample size, the survey shows existence of malnourishment amongst the community making us believe that transition from emergency phase to long-term development is required.
Proposed Intervention:

Figure: 3. 2011 Global Hunger Index, Pakistan ranks: 59.

Pakistan ranks 59th on Global Hunger Index and falls amongst those countries alarmingly faced with this problem (IFPRI GHI report, 2011). As depicted in Figure: 3 the proportion of undernourishment amongst the population is increasing resulting in more underweight children despite the fact under-five mortality is decreasing. Pakistan needs to have a cost effective measure to improve the nutritional status of under-five children and mothers in an acceptable way to sustain the rapid urbanization. Faced with such scenario we will not be able to support the level of inequalities that will develop amongst the population when deciding how to provide adequate nutrition to their children either in urban or rural setup and others going for fast food.

It would be easy to integrate the CMAM programme with existing PHC system to fight the malnourishment existing in Pakistan. During emergency phase, working groups and clusters came into existence to co-ordinate the activities and pave the way towards sustainable development. Health and nutrition cluster are always integrated and work in co-ordination. The rationale was to support the government and MOH to develop policies based on the experiences and targeting the future development. This practice was effective in involving, communicating, and engaging with the government in developing a shared framework in the form of a national nutrition policy and strategy. Humanitarian organizations were successful in fostering the sense of local enthusiasm and ownership of the CMAM programme during emergency. Now the government policy and strategy needs to enhance the national ownership by incorporating it into border health policy at all levels.
Ultimately, the change in political affection will not have a confounding effect on already existing policy framework and services.

A key advantage of taking the government on board is to sustain prioritization and ensure availability of funds for infrastructural support without dependence on international support. In case of Pakistan, the MOH and the Nutrition Wing has already worked out the national guidelines for the CMAM programme only further integration into the PHC services is required. This will not only improve the level of health services provided and will assist in reinstating the community ownership of the programme. This will help us prepare for future calamities in timely and more efficiently manner. Similar integration model practiced in Uganda, faced with persistent conflicts and civil war for many years, increasing the psychosocial and mental health problems in the region. The local government tried involving the mental health services in to routine health care at the community level with support of health care providers and training the local community members. Joint planning and coordination at the community and the government level has proved successful in developing countries in the past and may do so in fighting against malnutrition (Baingana and Mangen, 2011).

Existing primary health care staffs were involved in training on the CMAM programme, visualizing the sustainability of the programme in developmental phase. This was feasible because they were already part of the health services, locally available in the community and trained to perform better in existing role even after emergency phase. This was thought as a step toward integrating the new services into already existing services in urban and rural areas. Community involvement in the training was to ensure reduction in the workload of the PHC staff, improving the case identification and timely referrals. Involvement of community resource person has shown improvement in health services and aided in acceptance of the community-based interventions in developing countries (Nsungwa-Sabiiti, et al., 2007). Similarly, local volunteers trained amongst the community in Sudan by health care staff to detect and prescribe medicine for the treatment of Malaria cases in the distant communities that could not reach the health facility (Elmardi, et al., 2009). To facilitate long-term mentoring and acknowledgement from the government, trainings had been given to service providers and the management, at national and provincial level. With accreditation from the government, human resource trained on the CMAM programme included, 155 master trainers, 4600 health care providers and 2750 on IYCF (UNICEF, 2011). If the MOH is able to mobilize these trained staff for further sensitization and capacity building of existing staff in the community and health facilities, we can expect marked reduction in malnourishment, micronutrient deficiency in children and PLWs. To foster a sustainable development of the programme, the government health institutes (Health Services Academy and MOH Nutrition Wing) were involved in training design and incorporation into national training programmes, with the aim of monitoring the quality of services imparted in crisis and afterwards. The data from the field collected and maintained through the Nutritional Information System (NIS) introduced by UNICEF, helps monitor the programme
targets and goals. NIS also provides an up to date evaluation of the programme and thus can come in handy for the government and MOH to maintain a check on effectiveness of the programme. Otherwise, the old weekly update sharing mechanism can prevail between the stakeholders to present the weekly regional progress of the programme as during the emergency phase. Timely evaluation will ensure the strengthening the quality of services and will provide a constant check on the targets for effective implementation.

Integration of CMAM programme with current health system will result in improvement of nutritional as well as health services amongst the most marginalized both in rural and urban areas. The human resource used will be the same and the services provided will be two fold. Data collection will be better and beneficiaries never missed in the community when designated health and nutrition staffs same or working collaboratively. We can get better services at one place rather than mobilizing different teams. In urban areas, the turnover of beneficiaries is greater, either to government or to private health centres. Most illness and complications have been assessed, for treatment or referral by trained staff residing at the BHUs in rural areas. The chances of developing complication will be reduced when nutritional; health status of children and adults is monitored timely and routinely. Better health education and awareness can be provided at the BHUs and in the community by CHWs, LHWs and outreach workers. This will result in better health access, better services, better prevention, improved coverage and better quality of life for all. Pakistani five rupees paid at the BHUs for all the services. The idea is to provide a holistic, integrative and comprehensive health services that can fulfil the changing needs and yet the continuity of services ensured. Developing resilience, coping tendency amongst the community, enhancing own skills while working with the government and fostering sense of ownership at the individual level. It will result in better sustained community infrastructure that can be adapted more effectively to change during crisis of developmental phase. After the phase-out of INGOs/NGOs from the region, local communities have accepted the transition and are coping to maintain the community-based services, but seek support from the government and it’s ministries to integrate the nutritional, social-welfare and health services in terms of continued resources to support the programmes.

<table>
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<th>Table 1: Pakistan Nutrition Status 2011</th>
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<td><strong>Pakistan</strong></td>
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<td>% of infants with low birthweight, (2006-2010)*</td>
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<tr>
<td>Early initiation of breastfeeding (%), (2006-2010)*</td>
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<tr>
<td>% of children (2006-2010)* who are: exclusively breastfed, (&lt;6 months)</td>
</tr>
<tr>
<td>% of children (2006-2010)* who are: introduced to solid, semi-solid or soft foods, (6-8)</td>
</tr>
<tr>
<td>% of children (2006-2010)* who are: breastfed at age 2, (20-23 months)</td>
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<tr>
<td>% of under-fives (2006-2010)* suffering from: underweight (WHO), moderate &amp; severe</td>
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<tr>
<td>% of under-fives (2006-2010)* suffering from: underweight (WHO), severe</td>
</tr>
<tr>
<td>% of under-fives (2006-2010)* suffering from: wasting (WHO), moderate &amp; severe</td>
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<tr>
<td>% of under-fives (2006-2010)* suffering from: stunting (WHO), moderate &amp; severe</td>
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<tr>
<td>Vitamin A supplementation coverage rate (6-59 months): 2010, Full coverage (%)</td>
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<tr>
<td>% of households consuming iodized salt, (2006-2010)*</td>
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In Table 1, nutritional status of Pakistan represented in terms of percentage to the developing countries in Asia and in relation to the world. The data from 2006 to 2010 shows that Pakistan shares 32% of the children having low birth weight and Asia shares 18% burden of low birth weight infants born in the developing countries. There are high possibilities of improvement in the current statistics with integrating the CMAM programme with PHC services. Infants born with low birth weight may become healthier in initial developmental phase by educating mothers by reinforced guidance. Through this intervention percentage of children, being exclusively breastfed may increase many folds; percentage of earlier initiation of breastfeeding needs to improve with regular awareness and education during antenatal visits. This programme focuses on both pregnant and lactating mothers. Chronically persistent moderate or severe malnourishment accounts for the 32 percent of stunting and 10 percent of wasting in children before reaching the second year of their life (Black, et al., 2008). The percentage of households consuming iodine was very low, directly affecting the cognitive and functional development of the children (de Benoist, McLean, Andersson, and Rogers, 2008). Iodine deficiency resulting in Goitre, initially reported in young women from the northern hilly areas of Pakistan, but more recently many cases were reported in all parts of Pakistan. Amongst the children and women of childbearing age deficiencies of iodine, iron, zinc, calcium, folic acid and vitamin A and D is been reported more commonly. Iron deficiency anaemia is the major problem reported in pre-school children and women in Pakistan. Although the figures are lower when compared to India and Bangladesh, yet we need to respond, as increasing urbanization will inversely affect the nutritional status of these children and women (UNICEF SOWC, 2012). The CMAM programme is been designed to deal with micronutrient deficiencies and to improve nutritional status of under-five children, pregnant and lactating mothers, along with other advantages such as community ownership and involvement.

Table 2a: The Rate of Progress

<table>
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<tr>
<th>Country</th>
<th>Under-5 mortality rate</th>
<th>Average annual rate of reduction (%)</th>
<th>Reduction since 1990 (%)</th>
<th>Reduction since 2000 (%)</th>
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<tr>
<td>Pakistan</td>
<td>33 173 124 101 87 1.7 2.1 1.5 1.5 30 14</td>
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During 2011, Pakistan ranks thirty-three on basis of under-five mortality rate in the World as expressed in Table: 2a and b representing the basic health indicators. This shows that there are still lot of obstacles, which need to be overcome with proper planning and implementation of the health services. Table 2a; briefly explains the rate of reduction of under-five mortality rate from 1970 to 2011. Still we are far behind, our achievement under Millennium Developmental Goals (MDG4). Almost 35 present of under-five deaths are due to undernourishment (Black, et al., 2008). We are not only faced with under-five deaths, but also neonatal and infantile deaths which are due to correctable causes such as undernourished in mothers and children. Timely awareness and proper counselling can make lot of difference in this regard. Although obvious improvement is present, we need to emphasise practices which could be acknowledged and continued for a longer time. This becomes obvious from Table 2b; although life expectancy at birth has improved due to medical advancement yet the early development of a child is faced with many challenges resulting in increased under-five, neonate and infant mortality rates.

First two years of child’s life are very important for normal development. Good cognitive, physical and social development of a child is only possible with proper nutritional care and
mother’s health, is another important factor that cannot be disregarded (Victora, et al., 2010). Table 3; represents the maternal health status in Pakistan, it is obvious that multiple factors are related to maternal health such as education, antenatal care, place of delivery can affect infant nutritional and early development. Proposed intervention can improve coordination between health and nutritional services, resulting in early detection during antenatal visits and ensuring regular follow-up visits (Olusanya, Wirz and Renner, 2010). Community participation and involvement of local stakeholders can play an advocacy role toward better prenatal services. Proper examination and history during antenatal visits can improve the identification of complications earlier with evidence from patients history will help in educating the mother effectively. This will help increase number of women coming for frequent antenatal visits and seeking health promotion. The CMAM programme involves a component of infant and young child feeding (IYCF) (WHO and UNICEF, 2003), through this breastfeeding corners were established in the health facilities. This practice resulted in an increase in breastfeeding practice, especially breastfeeding and proper feeding techniques taught during health education sessions. Table 1; shows the percentage of children exclusively breastfed and up to two years of age. A pattern in antenatal visits and breastfeeding exhibits some similarity in Table 1 and 3, which can improve by integrating health and nutrition services (Saha, et al., 2008). This will aid in achieving the MDGs 5 more effectively and sustainably. Malnutrition is also associated with higher maternal mortality rate and women giving birth to low-birth weight children. Most deaths during childbirth are because of iron deficiency anaemia, contributing to higher maternal mortality rate. Iron deficiency is due to micronutrient deficiency persisting for long time and mostly associated with improper diet. During pregnancy, the foetus does not get proper nutrition in malnourished anaemic mothers, giving birth to low birth-weight children. The low birth-weight children are more susceptible to early childhood illnesses and thus escalating the infant mortality rate. The nutritional and the health factors are both interrelated when relating to child and maternal health, so needs to be tackle as a joint problem (Bagchi, 2004).
The efforts pooled in by the government and the stakeholders should be equally visible as the marker of their own worth during analysis. Such as when comparing Table 4; showing improved immunization status, access to safe drinking water and IMCI with the previous tables. The services when integrated together can have a cross check on one another. Indicators will show improvement in the services with respect to each other. Access to improved drinking water in Table: 4 shows marked improvement, but still under-five are reported with diarrhoea, leading to micronutrient deficiency and undernourishment. People need proper counselling to continue breastfeeding the children, suffering from diarrhoea and to maintain dietary balance. Especially neonatal diarrhoeal cases being reported more when supplementary feeding started before the age of six months. The ideal time would be to educate the mother during antenatal visits about exclusive breastfeeding, complementary feeding and dietary needs of the children using the established breastfeeding corners (Zehner, 2009). The CMAM programme follows the standard immunization protocols. Improved immunization coverage will be obtained if health and nutrition services are combined. Under-five children and PLWs enrolled in the programme will be assessed for their immunization schedule and dietary supplementation. This will help in reducing the under-five mortality and maternal mortality rates. Better antenatal and postnatal care will be provided and follow-ups ensured with support of LHWs and TBAs available in the local community. Chances of beneficiaries being skipped for nutritional assessment will be reduced when both services are integrated at the facility and in the community. The need is to focus nutrition as centre of existing problems and constitute policy and framework in light of it observing its effect on existing health issues in the country. This will support in identifying why we are still not able to attain MDGs 1, four and five because prevailing nutritional status is negatively impacting the health system at all levels, justifying the need of an integrated effort that is in the interest of all.
Availability of services and the community availing them shows how much acceptance or awareness is present. We will always see variation in trend amongst urban and rural community, as in Table 5, the ratio of urban to rural corresponds to the overall trend seen in developing countries, but with respect to Pakistan there is need of lot of improvement. Developments need to prioritise advocacy and strengthen the implementation strategy with community involvement and mobilizing resources. As it is obvious people in rural areas need more education about health and hygiene, to understand how to obtain better sanitation facilities. To improve health, nutritional assessment, food securities, food preparation, hygiene condition and dietary pattern of the community needs to be understood. With the support of the trained health staff and the CMAM programme design targets public awareness, impact of obesity on non-communicable disease and nutrition education at all levels. Community involvement through grouped sessions conducted by local LHWs, CHWs and CRPs have been successful during emergency, will prove to be more sustained and effective when conducted regularly at health facility and community level with support from local radio and media. Now the educational preference has almost become equal for boys and girls in rural areas, most girls are educated up to higher secondary level and few attain bachelor degrees. Educated mothers are always keen to learn about health and nutritional education and in spreading the message. Still a lot needs to be done to reduce the social inequalities and the escalating gap between urban and rural communities.

This is the most cost effective yet practical way to provide better services to all and that is what we strive for in the Millennium Developmental Goals (MDGs) (Steer, Levy, Geddes and Lemma, 2010), which we have partially attained despite of so many endeavours. With the improvements visible in the health, system of Pakistan since 2006 as presented from the tables used above, we could expect far better results with the CMAM programme integrated. Similar integration model practiced in some African countries showed appealing results, when they compared the implementation of the CMAM programme in ideal and
worse case situations in Malawi. This showed that with the CMAM programme the cost of treat was 42 US$ with disability-adjusted life years (DALY) and without it the cost of treatment was 493 US$ DALY (Bachmann, 2009; Wilford, Golden and Walker, 2011). After the emergency period, different stakeholders (healthcare providers and parents) are ready to uptake and continue the CMAM programme with support from the government. With support of WHO first nutritional strategy was established for Eastern Mediterranean region, to sustain nutritional crises and develop strategic approach based on suggested targets to be obtained up till 2019 (Bagchi, 2008).

**Figure: 4. The Model of World Urbanization depicted showing Pakistan during 2010**

![Image of urbanization model]


Today, reduction in level of poverty and hunger is becoming difficult when challenged with existing levels of socioeconomic inequalities. Food, social care and health are the basic needs of an individual and have strong association. Socio-economic condition has a direct effect on these basic needs; an effect on one will result in demise of other. As depicted in Figure: 4 the model of urbanization shows, 36% of Pakistan’s population lives in urban area (62 million) and it is projected that by 2020, 40% and until 2050, 59% will be living in urban areas (UNICEF SOWC, 2012). Pakistan being a developing country with this rate of urbanization faces more health related problems. The gap between low and high-income class will become wide. When estimated more than 40% of population will dwell in urban areas, cultural factors, resources like time, income and health services will affect the level of care. Levels of unemployment will adversely affect the level of care, for children, elderly and sick making them more vulnerable. Food security means to have enough resources to provide enough and continuous food for the members of the family. All this comes to affordability and access to health, safe water, sanitation, healthcare services and healthy environment. If these three basic requirements are out of reach of an individual than his
Disposable income will be spent on the cure and prevention of illnesses of the family members. Seasonal migration is very common in the bigger cities during winters and in few areas during summers. The cost of living will increase as the demand of services will increase. In urban areas, government and private sector provide health services. Low and middle-income class mostly utilizes government run facilities; these services are almost free of cost except for operational cost that is minimal. Due to high burden on the government facility, some limitations are there regarding intake and availability of resources for all.

Quality of services and the burden on government health sector as compared to private health services has promoted inequality amongst different classes. Nutrition services are least considered in low-income groups, in the urban setup, health services pay most attention to curative aspect of healthcare. In rural areas, agriculture cultivation being the major source of income for people, yet the nutritional status is still low in comparison to those living in urban area, spending more on the routine food items. Tax on food and food by products needs to be reduced by the government in order to reduce the inequality and social gap leading to a healthy community. Overall, 23 present of Pakistan’s population was living below international poverty line during 2009, now these figures are suspected to be much higher as the average national inflation rate is greater than 10 present reported in SOWC report 2012. As a result, most people belonging to low-income group in urban area have developed micronutrient deficiencies. Malnourishment and micronutrient deficiency is most common among under-fives and women. Most women work beside men in rural areas, dietary needs of children and mother are not met and most attention given to the male earning member who supports the family. This discrimination can end by educating the women of all ages and the men in the community, with prospect of a healthy family. Through the educational and awareness component of the CMAM programme, we can minimize such practices, when we are unable to improve the socio-economic status overnight.

In urban secondary and tertiary care health facilities, provision of CMAM services on routine basis will be of great support to people from all lifestyles. The nutritional programme is been provided at the health facility, as a result the neglected children especially under-five and the PLWs will have a better access to healthcare. Already the outreach teams in the form of LHWs and School health and nutrition supervisors working to promote awareness and referral of identified cases to the facility for better care. If this programme has achieved the desired results in rural areas than the implementation in urban setting will be much easier and our basic health indicators will improve. The acceptance of the CMAM programme will be better as the people are educated and the health services are available almost free to the people attending the government hospital, being the burden sharing entities in the urban areas. The school health and nutrition supervisors are supposed to provide health and nutritional awareness sessions at the primary and secondary schools creating better understanding of health care.

Already the Stabilization Centre (SC) operational as a component of the CMAM programme in secondary and the tertiary care health facilities for the children identified with complication, either due to undernourishment or due to childhood illnesses. The SC is design to work in the district and tehsil hospitals incorporated with paediatric unit, dealing with the referrals from the respective communities. With the supported effort of WFP,
several of the supplementary feeding products are being manufactured locally by using the entities available in daily life thus reducing the cost of getting the rations for the treatment of children and women who are classified MAM. The government strategy and initiation is required in production of nutritionally fortified products from locally produced food in acceptable, affordable, sustainable and safe way. Reason that the CMAM programme has achieved such acceptance in rural areas, is that the pregnant and lactating mothers were directly involved in the awareness and prenatal formal education about the child early developmental needs, including promotion of exclusive breastfeeding and start the timely use of locally available food during complementary feeding (Semba et al, 2008; Bhandari et al. 2008). Effort is required in the urban areas as prevalence of breast-feeding is less; predominantly in high-income groups and bottle-feeding is more preferred. With adequate education and awareness, breast-feeding can be established. Government has already incorporated baby friendly hospital initiative to increase the rate of exclusive breast-feeding in urban areas. Healthcare providers and pharmaceutical company representatives are not to promote formula milk in the hospitals setup. With support of UNICEF, several breast-feeding corners established in the health facilities at rural and district level, to educate and promote infant and young child feeding (IYCF) practice. Similar IYCF practices can prove helpful in urban areas with feeding nurses in private as well as the government hospitals. Still there is need of proper understanding about the concept of exclusive breastfeeding for six months and start of complementary feeding along with breastfeeding until two years of age. IYCF being an integral part of the CMAM programme, is the most natural yet effective way of eliminating undernourishment, cognitive development of children and most nutritive source of vital nutrients during illness (Dewey and Adu-Afarwuah, 2008; Engle, et al., 2007).

Understanding the social determinants of health and for an intervention to be effective, the economic aspect is very important. The CMAM programme designed in a way to strengthen existing health system by targeting the social determinants of health at macro, meso and micro-levels. Macro-level includes allocation of equitable resources and sustained public policy. Meso-level explains enhancing community involvement at all levels and a decentralised policy. Micro-level involves financial, psychosocial, physical, administrative and cultural aspect of health care system and the providers. Instead of vertical approach, the CMAM programme focus on horizontal approach towards better health care. The horizontal or longitudinal approach targets individual focused preventive and curative care at the same time interacting with different sectors; education, economy, work, housing, environment and other social factors. Several lessons learned in the early 20th century, proved vertical disease oriented programme were not cost effective as were thought to be when planned and implemented. Implementing the integration of programme such as the CMAM with existing health care system can improve better disease control at community and health facility level. These social inequalities may possibly be reduced by making the services universally available for all at national, provincial, district and at social security level health care, by planning and developing better intersectorial primary health care with multi-axial strategy.
As we are face with problems such as increasing population, mass urbanization, food insecurities, increasing cost of living and high food prices, we must not forget the climatic changes taking place and their direct effect on us. Climatic changes always affect the agriculture production, as crops are seasonally grown. Marked increase in the temperature reported in 2010 resulted in many natural disasters throughout the globe, caused drought, famine, floods and many more yet to be seen. Implementing programmes such as the CMAM will enable the community develop more endurable strategies to face such calamities. It is through the capacity building and the awareness we can teach about the crops that can be grown to match nutritional needs (Baillie, 2009). Since the first decade of 21\textsuperscript{st} century, Pakistan has experienced several droughts and it is predicted that there will be more with devastating results affecting agriculture and economy badly (Ahmad, 2004). To prepare for the natural calamities the government and MOH need to develop strategies to have a sustainable contingency plan based on health and nutritional needs of the people.

The CMAM programme is proven effective in comparison to about thirteen nutrition interventions designed and implemented worldwide in lowering under-five mortality, improving the nutritional status of children and women and protecting human capital. Several trials and meta-analysis were conducted to compare the results in different community based models based on efficacy and effectiveness of the treatment modalities in relation to the cost and life year benefits. Hence proving that the CMAM programme is more easily manageable yet being cost effective. Locally manufacturing of the rations for SAM and MAM has further reduced the running cost of the programme. The RUTF for acutely malnourished and supplementary food for moderate malnourished children and women has been produced from locally available legumes, peanuts, chickpeas, micronutrients, soybean extract, soy flour, rice, vitamins, milk powder and minerals in variable quantity for each treatment plan. WFP has supported worldwide in initiating the local production and packaging of the fortified multiple micronutrient rich rations reducing the cost of treatment ranging from US$ 0.07 to 0.10 per participant. WFP is using composition and preparation methods of local foods such as “khichri” and “halwa” found in the Asian countries, as fortified rations for treatment, thus making the community using existing practices for their benefit and at an acceptable cost. Another advantage of the community-based programme is to provide treatment at home with guidance and supervision from local healthcare teams. Increasing the coverage and reducing the treatment cost on the part of family as they save the expense of staying at hospital and the expense of accompanying caregiver spared as well. During home visits, mothers and other family members are also assessed and if required suggested treatment and awareness created amongst others. Family feels comfortable when mother or baby remains at home. This method has also proved to improve referrals as people identify cases within the community. Signs of improvement are obvious within days and that has increased the
acceptance of this intervention in different developing countries (Bachmann, 2009; Horton, et al, 2010).

Pakistan being one of the contributors to 90% of stunting reported in the world, as explained earlier chronic malnutrition is the only major cause of stunting, resulting either due to the malnourished pregnant mother or delayed development of children. A comparative study for a period of 36 months has shown that community based interventions can reduce stunting by 36%, infant mortality by 25% and other associated causes of early childhood illnesses by 25% (Bhatta, et al., 2010). The expected and the tested responses from these studies have proved the extent of acceptance amongst the community, when given the opportunity to choose for a better service. The results shown in the above studies are based on the comparison of different nutritional programmes tested for compliance, has proven its worth when integrated with the PHC services. The idea is not to eliminating the options people or the government have, instead a sustainable solution toward preparedness and better solution to future health issues. The government and the MOH do need to take actions guarding their own benefits yet keeping the healthier choice the default option for the people. This may be considered a step towards shifting of decision making from central level to the local level such as currently being under consideration in the developed countries (Kmietowicz, 2010). Implementing the CMAM programme at national level can help reduce stunting due to child and maternal under nutritional causes as evident in developing countries and we will be decreasing the socioeconomic inequalities for generations to come caused by stunting (Monteiro et al, 2010).
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