

Workshop on Design of Kitchen cum Stores and WASH Facilities

Date: 29th April 2013

Venue: CIET, NCERT Campus, New Delhi

Ministry of Human Resource Development organized a one day consultation, of State MDM officials, - specifically those who are involved in the design development, to discuss the design of Kitchen Sheds to be constructed over the next few months, across the country. The purpose of this consultation was to review the design of Kitchen Sheds, with a view to integrating multiple hand washing facilities with soap and energy efficient cooking systems in schools. List of Participants is given in Annex 1.

Inaugural address

Dr. Amarjit Singh, Additional Secretary, MHRD, GOI.

Additional Secretary, Ministry of Human Resource Development, GOI, Dr. Amarjit Singh welcomed the participants to the workshop. He drew attention to following critical areas of the Mid Day Meals programme;

- Ongoing construction of kitchen sheds in the Mid Day Meals programme with more than 6 lakh kitchen sheds is already completed, another 1.5 lakh under construction and the remaining 1.5 lakh yet to start construction.
- Impact of better nutrition and health on higher attendance in schools
- Indirect positive impact that MDM has on goals of social integration, addressing malnutrition, bring the girl child to school.
- Importance of having simple multiple handwashing facilities in schools for children to practice handwashing with soap before the MDM.
- Importance of functional and clean toilets.
- Increased cost burden of cooking of almost Rs.1500crores/yr on account of removal of LPG subsidy for institutions.
- How sensitivity in design of MDM Kitchen cum store can lead to better nutrition and hygiene
- Critical change-making role that Civil engineers can play in ensuring better nutrition and hygiene practices, contributing to higher achievement of overall educational goals.

Significance of Mid Day Meals Scheme

Mid Day Meals is a flagship programme of government of India. Covering 110million children in 1.212million schools, employs more than 2.6 million cooks and helpers and is able to reach more than 104.4million children. It is one of the largest welfare programme of Govt. of India with a budget allocation of Rs.13,215 crores for 2013-14. The MDM programme has documented evidence of impact in several critical areas including;

- **Promoting school participation and eliminating classroom hunger.** Mid Day Meals has brought more children in schools. It has increased enrolment and retention, reduced the drop out rates in schools.
- **Promoting gender equity and inclusive education.** Proportion of students from SC and ST enrolled being more than their proportion in the total population, by bringing more girls in schools over the years.
- **Intrinsic educational value.** Contributed to learning in terms of a decline in male-female literacy rates showing a significant decline from 24% to 17% since 1991. Over the 2005 to 2009 period, out of school children have dropped significantly for all categories of children including girls, SC and ST populations and Muslims.
- **Psychological Benefits.** Contributed to a lowering of population growth in the poorest states of India since 1991.

“MDM has been quite effective if seen as a ‘food security net’ for nutritionally deprived children; it is one of the most potent school based interventions; raised the enrollment and attendance of children; an effective tool in bringing social harmony; women empowerment and addressing livelihood issues” Prof Amartya Sen.

It is also endorsed by Supreme Court appointed Commissioners as one of the better run schemes in the country.

Emerging challenges of Kitchen sheds, energy savings in cooking and WASH facilities in schools

- Data on girls toilets in schools reported in DISE and ASER reports shows divergence. Non functional girls toilets as per ASER report are three times the DISE report for 2011-12.
- Functional girls toilets as per ASER report are less than 44% as compared to 59% as per DISE.
- Simple hand wash facilities with soap at critical times before eating and after defecation, can make a big difference to health and hygiene results for schools children.
- Simple innovations can make kitchen sheds more hygienic, make effective use of space for storage, cooking and serving food.
- Solar cookers can reduced energy bills and make cooker safer and smoke free.

Thematic presentation highlights

1. Design – Ideas to develop MDM Kitchen Cum Store

Presentation made by Kabir Vajpeyi, Infrastructure Advisor, SSA and Principal Architect VINYAS

Current Norms for Design and Construction

- 20 sq.m of floor space for every 100 children enrolled in school
- Thereafter, for every additional 100 children, 4 sq.m of additional area is permissible.
- The construction cost is to be determined on the basis of plinth area norms and State Schedule of Rates prevalent in the State/UT, since 1.12 2009

Design Priorities

The school kitchen shed includes three specific areas;

- Safe storage
- Hygienic cooking and serving

- Hygienic Drinking Water and Hand washing

Recommended Design Guiding Principles

- Provision/space must be proportionate to children's enrolment
- Storing, cooking and serving to happen in safe, secure and hygienic environment
- Design and its provision must be child friendly
- Design and activities around must inculcate the values of healthy eating practices and social values of equality
- Design must be sensitive to local culture and traditional methods of cooking
- Design must have integral provision : store, wash area, preparatory area, cooking area and serving area
- Design options must allow expansion of key components, with natural light and ventilation to be used maximally to keep the place clean, dry and hygienic
- Design must allow diverse and safe building systems to be used – so that s
- Design must allow natural sunlight and ventilation to be used maximally.
- Kitchen fixtures and hardware must be rodent and pest proof
- Operation and Maintenance of the construction of the design must be simple and low resource consuming.
- User and environment-friendly energy saving or renewable energy options must be planned along with Kitchen

Two design options based on different scenarios were presented and shared:

- a. One design which fulfills all the requirement of an ideal kitchen cum store and the area norm, The same core concept can be used, with increase in area allocated for storage, cooking and wash areas for 100, 200 and 300 children respectively.
 - b. Another design which again fulfills all the requirements of kitchen cum store usage and area norm and is also expandable in a linear manner by making few minor changes for increased storage, cooking and wash spaces, if the enrolment count changes after some time in the school
1. It was also reiterated that design has to be conceived in an integrated manner with other components of the school – the learning process, kitchen or herbal garden, MDM eating areas, as well as WASH. Components of Hand wash, drinking water can be made integrated with the design for necessary approvals.
 2. Various options of cooking stoves, including segregated waste management with MDM, including drinking water and hand wash facilities were shown. Engineers based on the situation can choose the best option applicable in their situation.
 3. It emerged that no single typical design can be provided centrally by the Ministry would be applicable for all the situation, hence State Departments need to make their own set of plans applicable in their respective situations, based on their cooking habits, eating habits, topographical conditions etc, There should be flexibility to make some modifications required specific to site and get them approved by the Ministry along with the costing.
 - 4. In the response and questions asked by the participants it was clarified that:**
 - a. Cost effective building technologies can be used in design

- b. Design should take into account hazard resistance features applicable in respective areas like fire, earthquake, land slide, floods, etc.
- c. Design can consider the most suitable energy system for cooking and design adapted to use that – Solar cooker, bio-mass gasifier, etc. – which can either supplement or replace the entire conventional energy requirement
- d. Costs need not be same across the state – regional variation, as directed by the State Schedule of rates for urban, rural remote sites, with regional variation is allowed as per current provisions.
- e. Some state engineers were not fully aware of the change in cost norm for constructing MDM kitchen cum stores. Some states were till date considering the old norm of fixed unit cost for constructing a kitchen shed in Rs 60,000 rather than using the latest plinth area norm.
- f. Older norm is only valid for those MDM kitchens cum stores which have been approved before 1.12.2009. If they have not been completed / there is cost overrun, it has to be met with State government funds and shall not be provided by the Ministry.

Hand washing with soap in schools

Mamita Bora Thakkar, WASH Specialist, UNICEF, Delhi.

The presentation shared the experience of successful hand washing with soap in schools in Philippines. Lessons learnt from this experience highlight the importance of both the infrastructure aspects as well as the behaviour change priority that makes handwashing a 'group activity' in schools, that is perhaps more important.

Significance of Hand washing with soap at critical times is that it contributes the most to reduction in diarrheal incidence, as compared to all other WASH interventions

- One-third of deaths in among children in India is due to diarrhea and respiratory infections.
- Handwashing with soap: reduce the incidence of ARIs by more than 20%
- Handwashing with soap : one of the most cost-effective interventions to prevent diarrhoeal related deaths and disease (Cairncross and Valdmanis 2006).
- Handwashing at critical times (before eating or preparing food and after using the toilet - can reduce diarrhea rates by almost 40 per cent (3IE 2009).
- Handwashing in institutions such as primary schools and daycare centers reduce the incidence of diarrhea by an average of 30 per cent (Cochrane 2008).
- Handwashing promotion in schools: reducing absenteeism among primary school children. In China, promotion and distribution of soap in primary schools resulted in 54% fewer days of absence among students compared to schools without such an intervention (Bowen et al 2007)

Framework for programming Hand washing in School: Philippines lessons

- Simple
- Scalable
- Sustainable

Design/Concept of Hand washing in schools

- Children make eye contact, receive and share messages on the importance of this practice (positive aspiration), which includes all peers (equity)

- Make it a fun activity
- Will result in - Health, attendance impact from this program

Handwashing behaviour change – beyond infrastructure

- Make hand washing behaviour change practice-based: build skills and habits based on daily repeated group activities
- Behaviour change is based on a social norm theory - promote group behavior instead of focusing on individuals behavior change
- Clear roles and responsibilities assigned to teaching staff to support and monitor children’s behavior change. Teachers as role models need to also practice hand washing with soap.
- School Based Management to ensure regular hand washing with soap by children through;
 - **Shared leadership** - personal commitment, sense of ownership, high accountability, shared responsibility
 - **Shared vision and objectives** - improve learning outcomes, enabling and healthy school environment)
 - **Sound legal frameworks and policy guidelines**- central, provincial and local, school improvement plans
 - **Multi-stakeholder participation**- local education governance, trust-building, definition of roles, collaboration.

Need to Institutionalize Hand washing with soap in schools by all children before meals:

- Simple multiple handwashing stands in every school – as a part of Kitchen Shed (wherever possible)- responsibility of filling the water tank can rest with the cook/helper.
- Include mass handwashing with soap before MDM by all children, teachers and cooks.
- Make soap available on a sustained basis – make use of MDM funds
- Designated time before the MDM is served- time to be allocated within daily schedule.
- Make teachers monitor this practice and SMCs responsible for oversight.
- Effective Monitoring (sms based or other methods) at the national level - Child Cabinets can support in data validation.

New and Renewable Energy Systems for Cooking in MDM

Priyadarshini Karve, Samuchit Enviro Tech

Energy requirement under Mid Day Meals Programme

- Fuel wood requirement for a mid-day meal comprising of rice, sambhar, and boiled potato/egg is cooked on a three stone fire: 160 g per child per day. (Ref: data collected from schools by TIDE, Bangalore)
- Total number of children fed across India under MDM: 111 million
- Total quantity of fuel wood potentially required: 17,600 ton/day
- Equivalent quantity of LPG required if the same food is cooked on a commercial LPG stove: 979 ton/day (51,462 commercial cylinders/day)

MDM cooking is a unique and specialized cooking energy service – a holistic service-focused approach is possible;

- Use of more efficient cooking energy devices (improved cook stove, LPG, solar, etc.) will reduce energy requirement by at least 50%.

- Cooks trained on energy efficient cooking practices will reduce energy consumption by a further 5-10%.
- Use of cooking utensils designed for maximum heat transfer efficiency and for specific food items and quantities can further improve fuel use efficiency by about 10-15%.
- Uniquely designed systems comprising of fuel + stove + utensils best suited to the needs of a school, operated by properly trained cooks can collectively reduce energy requirement by about 75% from the current status.

Efficient options suited for MDM

- Improved stove (different designs) + firewood
- Improved stove (different designs) + biomass briquettes
- LPG stove + LPG
- Biogas stove + biogas produced from cowdung and/or kitchen and market waste
- Solar cooking (different designs)
- Combinations of all or several of the above

The speaker summarized the presentation with the following comments:

- The most optimum cooking energy system, based on local, renewable fuels/energy sources can be tailor made to suit the requirement of each school.
- This approach will involve initial cost to put the systems in place, but is justified in terms of health, environmental and economic gains in the long run.
- The approach provides a long lasting solution to the energy aspect of the MDM programme, minimizing the running cost as well as hassle related to the energy aspect of the MDM kitchen at the school level. There are various possibilities to obtain sponsorship for the actual equipment.

Designs presented by States

Some States presented their designs:

1. **Bihar** presented the design with different type of storage system and higher area requirement to suit its needs
2. **Madhya Pradesh** presented a variety of designs options to suit diverse situations and needs
3. **Andhra Pradesh** presented designs using cost effective features, though some features were not accepted by other State participants.




Assam pointed out that in their urban areas, there is acute shortage of land and existing buildings cannot expand vertically. It was advised to them to address the issue of MDM in an integrated manner and perhaps emulate the solution having 'Akshaya Patra' centralized kitchen to provide MDM in these schools, rather focusing to create kitchen infrastructure in each school.

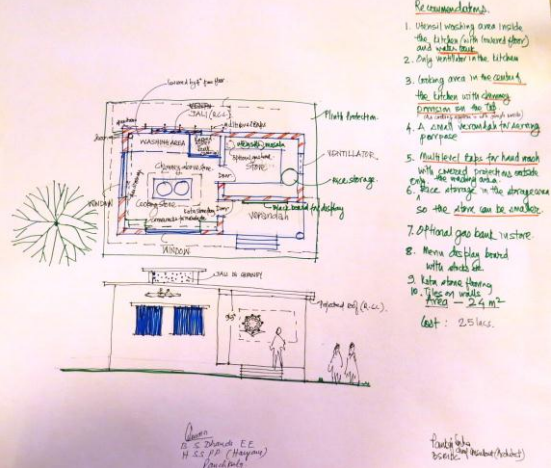
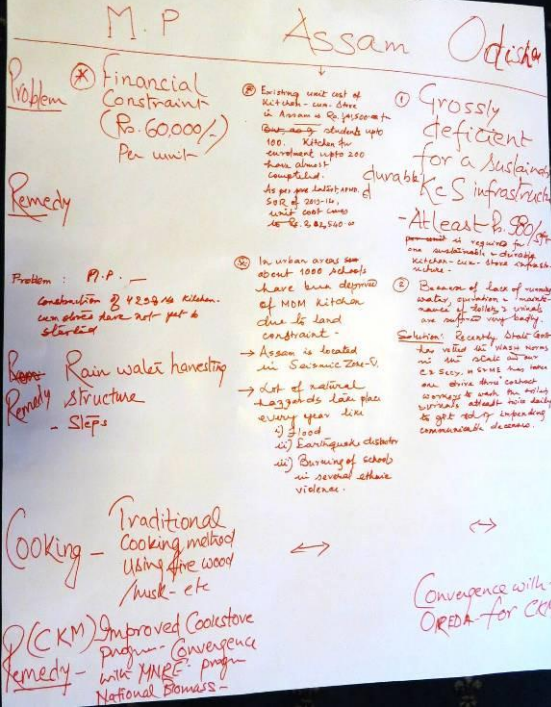
Group Work.

Following the thematic presentations, the participants got together in three groups to continue discussions and suggest action points for taking forward the agenda of the workshop;

Group	States	Members	Topic
1	Bihar, Tamil Nadu, Haryana		Overall MDM Design recommendations
2	Orissa, MP, Assam		Energy saving Devices and Planning
3	West Bengal, Andhra Pradesh, Maharashtra		Hand Washing integration with MDM

Key recommendations for Improving MDM Kitchen Sheds, Energy and Hand washing with soap:

MDM Kitchen Cum Store Design	Cooking energy Saving devices and planning	Hand washing in schools convergence with MDM
<p align="center">Group 1</p>	<p align="center">Group 2</p>	<p align="center">Group 3</p>
		
<ol style="list-style-type: none"> 1. Eating and cooking utensils washing areas should be inside the kitchen room and not outside, on a lowered floor (for drainage) and with a water tank inside the cooking area. This prevents animals from dirtying the washing area and licking the plates. 2. Water Tank inside the cooking room to be connected to a multiple point hand washing platform outside the room through a pipe through the wall. Water for hand washing can be regulated from inside. 3. Cooking to be done in the centre of the cooking room and not on the side. Chimney built above the centre of the room. This allows for mobility around the cooking stove/fire for cooking over a large utensil. 	<ol style="list-style-type: none"> 1. Traditional cooking methods using wood and husk need to be promoted 2. Improved cook stoves convergence with MNRE programme and national biogas programme – to be tried out. 3. Convergence with OREDA for CKM 4. Increase the outlay for construction of MDM Kitchen sheds 	<ol style="list-style-type: none"> 1. Make multi point hand washing facilities in both old and new MDM kitchen sheds. It is possible to do this by placing a 50litre plastic water tank inside an old existing MDM kitchen shed and make a pipe through the wall as suggested by Group 1 that connects water from the kitchen room to a hand washing platform outside with multi point water distribution for hand washing. 2. Recommend SSA to allow schools to use the School Infrastructure Grant/School Maintenance Grant for making a one time investment on multiple hand washing platform.

MDM Kitchen Cum Store Design	Cooking energy Saving devices and planning	Hand washing in schools convergence with MDM
Group 1	Group 2	Group 3
 <p> Recommendations 1. Utensil washing area inside the kitchen with hand pump and water tap. 2. Only water tap in the kitchen. 3. Seating area in the outside of the kitchen with drainage provision for the tap (to cater to the use of hand wash). 4. A small verandah for serving purpose. 5. Multi level steps for hand wash with covered platform outside only the washing area. 6. Waste storage in the verandah so the store can be smaller. 7. Optional gas bank, rustic. 8. Menu display board with photo etc. 9. Table above hanging. 10. Floor area: 24 sq m² - 24 sq m² - 24 sq m². Cost: 2.5 lacs. </p> <p> 4. A small verandah for serving cooked food 5. Multi point based hand washing platform outside the kitchen with a covered roof projection outside, and should be a part of the Kitchen Sheds 6. Option gas placement in the store. 7. Menu display board along with stock details 8. Kota stone flooring, Tiles on the walls. 9. Area of the kitchen shed – minimum 24 sq mts 10. Cost – About Rs.2.5 lakhs </p>	 <p> M.P Assam Odisha Problem * Financial Constraint (Rs. 60,000/-) Per unit Remedy Rain water harvesting structure - Steps Cooking - Traditional Cooking method Using fire wood / Musk - etc Remedy - Improved Cookstove program - Convergence with MNRE program - National Biomass - </p> <p> Existing unit cost of kitchen cum store in Assam is Rs. 1,50,000/- (Approximate) up to 100. Kitchen for 200 students upto 200 Rs. 2,00,000/- completed. As per govt. data of 50% of 200-10, unit cost comes to Rs. 2,00,000/- </p> <p> In urban areas some about 1000 schools have been deprived of MDM kitchen due to land constraint - Assam is located in seismic zone-V Lot of national agencies take place every year like i) Flood ii) Earthquake etc iii) Burming of schools in several ethnic violence. </p> <p> Grossly deficient for a sustainable KCS infrastructure - At least 80% per unit as required for 10% more investment in durable kitchen cum store infrastructure. </p> <p> Reason of lack of ready money, equipment, material, maintenance, etc. are sufficient very badly. </p> <p> Solution: Recently State Govt has started the 'KCS' scheme and has started the 'KCS' scheme in 2015. It is a good scheme and has been started in several schools. It is a good scheme and has been started in several schools. </p> <p> Convergence with OREA for CRY </p>	<p> 3. Soap for hand washing to be purchased as part of the Mid Day Meals purchase grants. 4. Promote hand washing messages on school stationary and on official letterheads and communications- explore possibility with NCERT on making this message a part of the school text book cover page 5. Fix accountability of head masters to encourage and to monitor and report on hand washing with soap. 6. Allocate designated time for hand washing with soap before mid Day meals. 7. Organize one specific training in the next 4 months – separately for teachers and cooks and helpers under SSA, on the importance of hand washing with soap. </p>

List of Participants

1. Dr. Amarjit Singh, Additional Secretary, MHRD
2. Shri Gaya Prashad, Director, Mid Day Meal Scheme, MHRD
3. Shri Kabir Vajpeyi, Advisor Infrastructure (SSA)MHRD and principal architect, VINYAS, EdCIL. TSG. New Delhi, Vinyas. Centre for architectural research and design, C-60 Anupam CGHS. B-13, Vasundhra Enclave Delhi-96
4. Shri Vibho Gupta, Architect Vinyas, C-74 Anupam Appt. Vasundhra Enclave New Delhi
5. Shri Prakash Laxmanrao, Nikose, Executive Engineer, Maharashtra Prathamik Shikshan Parishad, Charni Road-Mumbai
6. Er. Pradeep Kumar Pandey, State Project Engineer, OPEPA Odish School Education Department, Govt. of Odisha
7. Shri B.S. Dhandi EE, SPD Haryana, State Project director, Haryana School Shiksha Priyapna Prishad, Sector 5 Panchkula
8. Pankaj Sinha, Chief Consultant (BSEIDC) , Saidpur Patna
9. Shri S.K Haldar, Civil Engineer, MDM West Bengal, C/o Project director, CMDMP, School Education Dept. Achaly Prafulla Chanda Boho, Salt lake Kolkata
10. Shri S. Pradeep Kumar, Office Manager, Civil works Commissioner Director of school education AP Commissioner & director of school education AP, Hyderabad
11. Shri Bhagaban Dev Choudhury, State Project Engineer, SSA, Assam Sarvshiksha Mission Abhiyan, Assam Kahilipara, Guwahati-19
12. Shri Kumar Vimal Singh, Asst. Engineer, SSA Jharkhand Jharkhand Education Ranchi
13. Shri P. Mohan Asundaram, Executive Engineer, DRDA, Coimbatore,Tamilnadu Rural Development Panchayat Raj Department Chennai
14. Dr. N.K Shrivastava, J.C.M.D.M Development Commission office, Bhopal MP Development Comm. Bhopal MP
15. Shri Neerja Upadhaya, ADC MDM-Department of Panchayat & Rural Development, Bhopal-MP MDM Development Commission Bhopal
16. Ms Mamita Bora Thakkar, UNICEF,73, Lodi Estate,New Delhi
17. Shri Depinder Kapur. UNICEF
18. Dr. Priyadarshini Karve Samuchit Eviro Tech
19. Shri Vijay K Vaid, Project Manager, (NSG-MDM)EdCIL
20. Shri S.K Sinha, Sr. Consultant, EdCIL (NSG-MDM)
21. Shri Dinesh Pradhan, Consultant (MIS) EdCIL India Ltd.

- 22. Ms Tulika Tiwari, Consultant, Edcil India Ltd. NSG MDM
- 23. Shri Lokendra Mahavar, Consultant (Capacity Building) NSG – MDM
- 24. Dr. Mridula Sircar, Consultant NSG-MDM

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