

Update and Prospect of EM Technology in Nepal

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***Abstract:** EM technology was introduced in Nepal in June 1996 by CWDS in collaboration with APNAN/EMRO/INFRC. The first year (1996) was devoted to EM technology related information dissemination, training and demonstrations at few locations at Kakani in Nuwakot district and in/around Kathmandu Valley. The year 1997 was devoted to its extended expansion through EM stock solution production at four locations, several EM Technology Training, extension and information dissemination through publications, visits, workshops and experience sharing. In 1998, EM technology related activities were expanded in more areas and further strengthened during 1999. EM technology became known and familiar to the people throughout the country. The most important breakthrough in 1998 was the production of EM seed material (EM1, 2 and 3) by EMRO Researcher in Nepal at CWDS' EM Centre in Biratnagar which is cost effective and readily available than importing EM seed stock from EMRO-Japan. EM stock solution was made at five different locations in 1998 which has been extended to toehr locations in 1999. Besides, EM production centres, EM distribution outlets have been opened by individuals' and organizations' initiatives. This has made EM availability easier and approachable to the interested in the technology. The facilities at CWDS' Demonstration Farm & Training Centre and the support of EM technicians are being made available for conducting EM training to organized groups. The important step in 1999 is the inclusion of EM technology related activities within the programme of the agencies under the Ministry of Agriculture. Other interested professional/functional groups from GO, NGO, INGO and private sectors are equally being facilitated by CWDS. Observing the effective and efficient impact of the technology, efforts are in progress to establish EM Company for EM production and distribution facilitation throughout Nepal within the year 2000. The establishment of EM Company and its functioning would give a great push to EM technology for the overall development of the farming community and the country as a whole.*

Background Community Welfare and Development Society (CWDS) was established and registered under Social Service Act as a development NGO in June 1990 in Kathmandu-Nepal. CWDS believes that peoples' participation in Sustainable Agriculture and Rural Development is crucial to achieve food security and sustain the pace of development in the country.

The major objective of CWDS is to initiate and participate in the programmes which aim at enriching the quality of life and confidence of the people who are incapacitated due to illiteracy, poverty, ill-health, ignorance and ecological deterioration.

Educating the people through developmental initiatives, instigating their involvement in income generating activities, demonstrating/involving them in local

resource base farming practices associated with countrywide dissemination of sustainable agriculture concept/experiences through its regular and casual publications and capacity building/group mobilizing through training, workshop, exposure visits, community organizing etc., for social/economical/ecological upliftment are the major working areas. CWDS has been concentrating its efforts to make a significant change in the agrarian developmental initiatives and more on its sustainability component since 1991. With active involvement in developmental field and as a professional NGO in Nepal for the last 9 years CWDS has gained the confidence in its professional capability to manage and implement the development programmes of national importance in the country.

EM in Nepal Community Welfare and Development Society (CWDS) is a professional NGO in Nepal involved in promoting Sustainable Agriculture and Rural Development (SARD) related programmes since 1991. During 1996 June, EM Technology was introduced in Nepal through an understanding between APNAN/ EMRO/ INFRC and CWDS for the promotion of the technology. With continued technical assistance of Mr. Shouji Kanda (EM Researcher from EMRO) and APNAN, EM technology has spread in different parts of Nepal. The production/ distribution of EM stock solution is in increasing trend because of its established and broad-based benefits as has been experienced during the years from 1996 to 1999.

Production and Process

The production of EM stock solution in Nepal has gone through different steps over the time during the last four years. The first lot of EM (500 liters) was produced in the later part of June 1996 with technical assistance of Mr. S. Kanda at Demonstration Farm & Training Centre of CWDS and additional (1200 liters) of EM were produced during August and September in the same year at the same location (Table 1). In the later part of 1996, EM stock solution (500 liters) was made in Biratnagar for its distribution in the eastern part of Nepal, specially for tea growing areas. In the year 1998, EM seed (EM-1, 2 & 3) material was produced and stocked at Biratnagar EM Centre which has helped in making EM stock solution in the required amount at different locations as per the requirements. 13500 liters of EM stock solution were produced and distributed during 1998 and a quite significant increase is expected in the year 1999.

Table 1. EM Stock Solution Production Update (in litres):

S.N.	Place	1996	1997	1998	1999
1	CWDS' Farm & TR.Centre-Kakani	1700	2000	4000	2000
2	EM Centre-Biratnagar	500	1000	4000	2000
3	Eco-Service Centre-Narayanghat		500	2000	1000
4	Agri.Devt.Office-Pokhara			2500	1500
5	Agri.Devt.Office-Baglung			1000	1000
6	Rajghat JKM				1000
	Total	2200	3500	13500	8500*

* Until June 1999 only

Besides these production centres of EM stock solution, there are several other contact/distribution spots from where EM stock solution is being distributed to the users and those interested.

EM Training and Extension

The efficacy and impact of EM applications was so quick that the term EM has become popular among different groups of people and more at farmers level in a very short period of time. Besides continued promotion of EM, several training and workshops have been organized by CWDS (Table 2). The participants are from diverse fields varying from agriculture institute to farmers level; from research centre to actual practitioners associated with Gos and NGOs and private sector. Several EM technology training at different locations have been organized within this period. A one day workshop is being organized during December every year in Kathmandu to share EM experiences in different sectors and accumulate the feedback for future direction of EM experiences in Nepal. The participation of scientists and officials from Agriculture Department and NARC (Nepal Agricultural Research Centre) together with the representatives from NGOs and farmers is an encouraging indication about the increasing interest of people in EM and its technologies. The (one day) workshops of EM practitioners and others interested are also being organized outside Kathmandu whenever felt necessary (Table 3).

Table 2. Training and Workshop Update

S.N.	Place	1996	1997	1998	1999*
		Tr./ W'shop	Tr./ W'shop	Tr./ W'shop	Tr./ W'shop
1	CWDS' Farm & TR.Centre-Kakani	3/-	4/1	3/1	3/-
2	EM Centre-Biratnagar/Morang	-	1/-	-	-
3	Illam Tea Estates	-	4/-	6/-	-
4	Eco.Service Centre-Narayanghat	-	-	-/1	-
5	Institute of Ag. & An. Sc-Rampur	-	-	1/-	-
6	Other places	-	-	-	2/-

* Until June 1999 only

Table 3. Summary of EM events

Activities	1996	1997	1998	1999*
Training	3 (49)-Kakani	4(61)-Kakani 1(16)-Biratnagar 4 (126)-Illam	3(56)-Kakani 6(261)-Illam Morang,Panchthar	2(20)-Kakani 1(35)-Devighat 2(40)-Gulmi
Sharing Workshop	-	1(22)-Kathmandu	1(28)-Kathmandu 1(24)-Narayanghat	
Production Centre	Kakani	Kakani Narayanghat Biratnagar	Kakani Narayanghat Biratnagar Pokhara	Kakani Narayanghat Biratnagar Pokhara Baglung Rajghat
Production	1000	3500	13500	8500

*Until June 1999 only

Besides these organized training and workshops, regular interactions and field visits of EM technicians are helpful extension methodologies in order to make EM technology known to the large number of people.

Publications

While promoting EM and speaking about it to divergent groups of people, the need for introductory manual/handbook of EM in Nepali language was felt urgent to make our approach more effective and efficient. A brief introduction about EM technology is being regularly published through the quarterly publication KISAN (meaning FARMER) of CWDS having its readers/ subscribers in all the 75 districts of the country. EM Introductory Booklet and EM Practical Pocketbook, both in Nepali language, were printed in 3000 copies each in 1996 for general distribution all over the country through relevant individuals and organizations. These were the first printed material available elaborating about the technology and application aspect of EM in Nepali language and thus the attention of divergent sections of people was drawn towards EM and its utility In Nepali context.

The revised version of EM Technology Booklet (36 pages) was printed in 2000 copies in August 1998 as a technical support material for the extension of EM applications and its implications so far experienced in different parts of Nepal. The next updated version of EM technology booklet is planned to be printed in the year 2000 with the inclusion of new ideas as experienced in different parts of Nepal.

Successes/ Experiences

There are many more experiences/results of EM technology as experienced by the practitioner farmers. The positive results of EM technology in Nepal is the attraction which is bringing many more practitioners to adopt EM technology and the technology is becoming known to the people at the national level, although there is still some hesitance in the government sector because of several other dominant factors in the bureaucracy and at the policy level. The EM technology will make its breakthrough in Nepal because of its immediate benefits as experienced by the practitioners which is expected to influence and force the bureaucracy and policy-makers to realize its relevancy in the present context of sustainable agriculture and environmental concerns.

The use of EM technology in Nepal is very short, however, I am privileged to put forward the efficacy and impact of EM Technology in Nepal as experienced by our team and associates within the short period of time.

In Compost Making:

- EM is now the widely accepted technology in compost making which has reduced the required time to about 3-4 weeks which otherwise takes 6 to 8 months.
- All farm and animal wastes at farm level are easily converted to compost within a month which has become the major source material for the regeneration of already deteriorated soil due to continuous and unscrupulous use of chemical fertilizers.

- Kitchen waste (both raw and cooked) in the city area are easily and quickly converted to useful compost for agricultural use which otherwise were thrown in the waste bins adding to city pollution.
- EM has been proved to be of great advantage to few NGOs in city area involved in compost making using household wastes out of environmental concern and as an income generating activity for the organization by selling the compost for pot plants and flower gardens in the city area.

In Income Generating Activities:

- The poultry rearing farmers are using EM extensively in its feed, water and bedding to be relieved from the scheduled use of antibiotics and have better meat with improved weight and quality.
- According to farmers' expression EM acts as appetizer on pigs which make it to consume more feed resulting into quick fattening of pigs. The health of pigs is better and the filthy smell of the yard is reduced, almost nonexistent.

In Relieving Foul Odour:

- other more important point of attraction for using EM is getting relief of the filthy smell of poultry-yard which was a big problem as poultry raising is a household enterprise in residential houses for small scale farmers.
- Sher Bonemeal Pvt. Ltd., a factory in Patan city within Kathmandu valley making bonemeal and organic manure out of the collected remains of slaughtered animals (mostly buffaloes) for meat purposes, is using EM continuously to reduce the filthy smell of its factory premises which otherwise was a big issue within the surrounding/municipality.
- Pokhara municipality has started using EM (at one site) on city waste to get rid off filthy smell, although on a very small scale to observe the efficacy of EM in city waste management.

In Better Plant/Production Growth:

- The visible impact of EM applications on vegetable seedlings in nurseries has drawn the attention of the farmers involved in commercial vegetable production.
- The impact of EM applications on the growth, vigor and increased production of vegetables are the influencing cases on increasing use of EM.
- The influence of EM (use of Bokashi & 7 sprays) on root growth in Peas has impressed the farmers and extension workers about the positive impact of EM.
- The use of EM Bokashi in onion field has given unbelievable positive impact.

- Strawberry production has gone up with better quality of fruits by the use of EM Bokashi.
- EM applications has been proved beneficial in rice nursery raising.
- The increased yield of 6 percent in grains and 16 percent in straw in rice during 1996 has been proved valid in 1997 and 1998 trials as well.
- The use of EM on corn field has been quite impressive. Corn is the major crop and staple food in hills.
- The use of EM in Tea Gardens has been accepted as the best technology in different ways from making compost to treatment. Kanchan Jangha Tea Estate has been certified for its organic tea production and four other tea gardens are in conversion stage to organic using EM technology. Several other tea estates in eastern hills of Nepal are using EM technology and its different formulations in their farm operations.
- CWDS in collaboration with District Agriculture Office in Kavre district just outside Kathmandu valley, SANGA village has been using EM technology in almost all the farming activities. The village, if developed as EM village as being anticipated, would be the central attraction of the impact and impression of EM technology in Nepal.

Recommendations

Based on the experiences/successes gained and lessons learned while working with EM technologies so far in different sectors, the following recommendations are suggested to be considered to make EM technology a popular and dominant contribution in different field of activities in Nepal.

- EM is a new material in Nepal and therefore, it needs few validation trials both in agriculture and waste management sectors to have enough scientific evidence to prove the efficacy of EM with facts and figures in local situation to satisfy the queries of the inquisitives.
- EM has great potential to be integrated in promoting sustainable agriculture systems and therefore, CWDS needs to enlarge its SA network activities to promote EM in agriculture which is the dominant economic sector in Nepal still employing more than 80 percent of the population and contributing more than 45 percent in the total economy of the country.
- With scattered but intensive effort of CWDS and its functionaries so far, the interest of the concerned people has been drawn towards EM within the country which has made CWDS to be responsive and accountable both to the people and to EM related activities. After organizing few EM technology training and a workshops until June 1999, now it is high time for CWDS and its supporters (EMRO/ APNAN/ INFRC) to enlarge and strengthen the EM related activities together with ensuring the production of EM on commercial scale, its packaging, labeling and marketing system in Nepal.

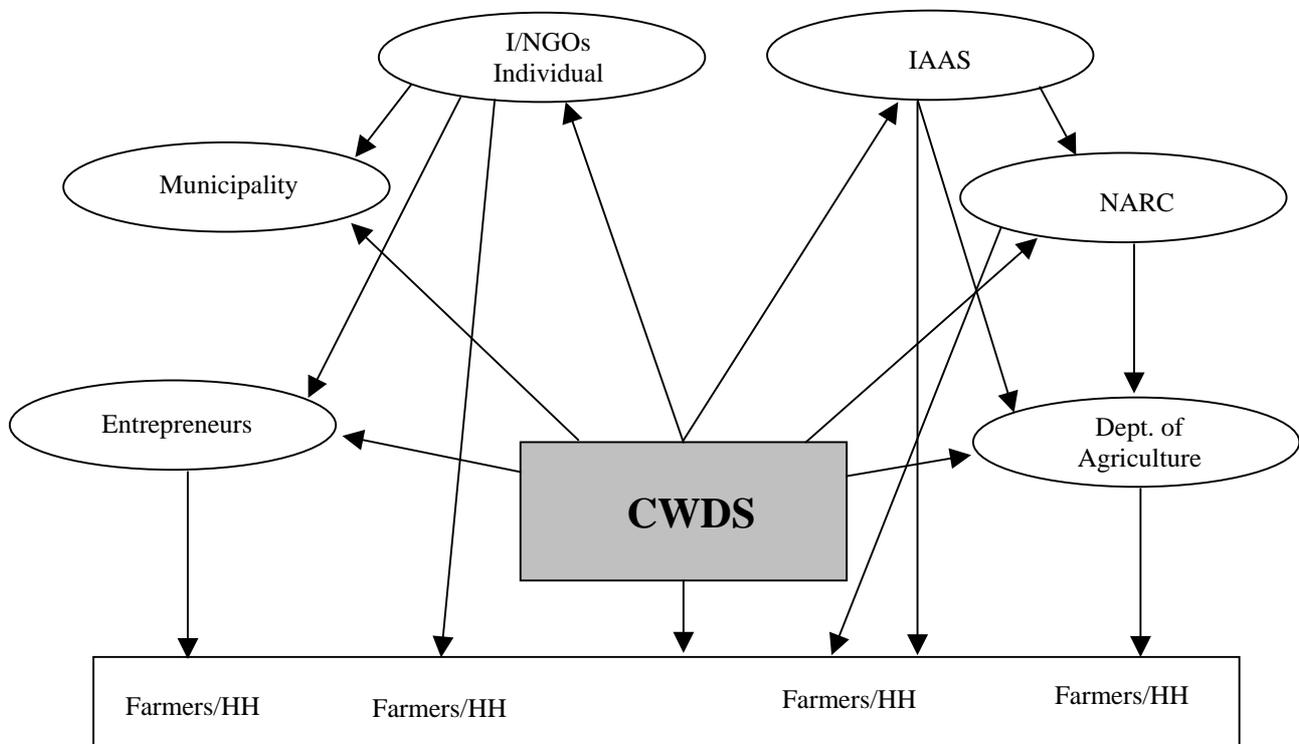


Figure 1. Functional Strategy of CWDS on EM Technology in Nepal