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An Assessment of Non-adoption of Compost Making in Piramanthanaru Grama Niladari (GN) Division of Kilinochchi District in Sri Lanka.

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Abstract: Waste management authority and the Central environmental authority in Sri Lanka recorded in 2018 that, 7500 tonnes solid wastes are being generated per day in the country. However, only 3500 tonnes is being collected by local authorities and remains accumulate. This study aimed to evaluate present knowledge of the people in Piramanthanaru Grama Niladari (GN) division, of Kandauualai Divisional Secretariate (DS) in Kilinochchi, Sri Lanka on home waste management and divergent contentions for non-adoption of compost making and suggestions for future adoption. Focus group discussion (FGDs), Participatory rural appraisal techniques (Transect walks, pair wise ranking and resource map) and written test were employed for data collection. FGDs were conducted with participants who were purposively selected from Piramanthanaru GN division. Decomposition rate of home wastage, methods of compost making, application of compost and its importance were questioned. The results revealed that minority (30%) obtained approximately 50% of total marks while others scored less than 10%.The majority (75%) of households used plastics, polybags as cooking fuel which depicts ambiguity of health hazardous. E- wastes considerably accumulated at households due to absence of local authorities. Pairwise ranking showed, lack of awareness on compost application and its importance, uncertainty of compost making methods, and requirement of large quantity compost were ranked firstly, secondly and thirdly as divergent contentions for non-adoption respectively. Attention of local authorities, regular visits of relevant officers and continual training and development were suggested for future adoption. To sum up, uncertainity often causes non/poor adoption. It is clear the necessity of integrated solid waste management around the country.

Keywords: Compost, Household waste management, Participatory rural appraisal

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Introduction

At present, solid waste management is a major concern internationally in terms of sustainable natural resource management and environmental protection and conservation (Tietenberg and Lewis, 2016). According to the waste management authority and the Central Environmental Authority-2018,Sri Lanka generates 7500t of solid waste per day while only 3500 tare being collected by local authorities. Northern province accounts nearly 248 to f solid waste generation per day with an average of 1-0.4kg/person/ day (Christopher, 2016; Pilisaru project, 2008).

Composting offers a method of processing and recycling bio degradable waste in one operation. This is the natural process of decomposition of organic materials by microorganisms under controlled conditions. The end product of the process is compost or humus which is of value in agriculture. In addition, compost could be considered as a value added product of organic materials, which has a high commercial value when compared to many other forms of organic materials (department of agriculture (n.d). Therefore, This study aimed to evaluate present knowledge of the people in Piramanthanaru Grama Niladari (GN) division, of Kandauualai Divisional Secretariate (DS) division in Kilinochchi district in Sri Lanka on home waste management and divergent contentions for non-adoption of compost making and suggestions for future adoption.

Participatory rural appraisal (PRA) is a methodological approach that is used to enable people to analyze their own situation and to develop a common perspective. Mainly four different PRA tools are, tools used in group and team dynamics; tools for sampling; options for interviews and dialogue; and options for visualization and preparing diagrams (Bie, 1998).

Materials and Methods

The study was conducted at Piramanthanaru Grama Niladhari (GN) division, of Kandauualai Divisional Secratariate (DS) division in Kilinochchi district, Sri Lanka. Where 15men and 15 women were purposely selected with their active participation. Then participants were grouped. Knowledge of the participants in compost making was assessed by a structured questionnaire. Each respondent was questioned about composting materials, different composting methods, dimensions for each method, composting process, compost application and importance of compost manure.

Moreover, three participatory rural appraisal (PRA) tools were appliedto enable people to analyze their own situation, namely transect walks, resource map, and pair wise ranking. The resource map helped researchers to investigate the background of Piramanthanaru community. The primary concern was not to develop an accurate map, but to get useful information. Accordingly, the participants developed the content of the map, then which was demonstrated.

Pair-Wise Rankings were conducted in order to identify the divergent contentions for non-adoption and suggestions for future adoption. Hence, causes/ suggestion swere compared pairwise. Transect walks were systematically with key informants by observing, asking, listening, discussing, learning about types of household waste materials, disposals and uses.

Results and Discussion

Kilinochchi is recorded as the highest poverty index district in Sri Lanka (Department of census and statistics, 2016).Same time nearly two thirds of Piramanthanaru villagers ravaged by years of civil conflict. No one was immune to the cruelty of war, displacement and loss. According to the resource map, the majority of the population depended on agriculture (paddy, coconut, banana, papaya, mango and ground nut are the main crops), livestock rearing (cattle, goat and poultry) and one-day laboring work are doing for their livelihood. It is highly noted that, the households were not belonging to any minor or major irrigation scheme. They totally depended on rain fed cultivation during *Maha*. During *Yala* all the paddy lands are not cultivated while wells are used as agro wells for other field crops. Noticeably, water crisis was during the middle of *Yala* season even for domestic purposes and drinking water for livestock. On the other hand, there was a water conflict between the Piramanthanaru villagers and villagers who belonged to Kalmadu lake to access Kalmadu lake water.

During the transect walk, regular household wastes both bio degradable and non-bio degradable and its disposal methods and uses were observed and disc ussed with key informants. Resultantly, improper disposal of waste was a major source of pollution, which caused unhealthy environment (Table 1).

Accordingly, it was concluded that, majority of them used polybags as cooking fuel because of uncertainty of its negative impact on human health and environment. E wastages were accumulated at households due to no visits of local authorities for collection. When considered the decomposed materials such as crop residues, paddy husks, papers, weeds and etc., the majority of the respondents frequently burnt it. And cow dung, goat manure and poultry manure were used directly to the perennial crops like coconut, jug fruit, guava and citrus. Individual questionaire results revealed that around 30% of them scored around 50% of total marks others less than 10%.However, they were aware of which wastages could be used for compost making.

Table 1: Household wastes and methods of disposal / uses

Bio degradable waste	Methods of disposal/use	Non bio degradable waste	Methods of disposal/use
Wood Ash	Washing dishes	Plastic bottles	Cooking fuel
Vegetable wastages	Direct application to home garden	Polythene	Cooking fuel
Egg shell	Direct application to home garden	Tin	Accumulation at home
Papers	Burning	Broken glass bottles	Accumulation at home
Cow dung	Direct application to crops	Electronic waste	Accumulation at home
Poultry manure	Direct application to perennial crops	Old cloths	Burning/Accumulationat home
Paddy husk	Burning	Broken furniture	Accumulation at home
Weeds	Burning	Used slippers	Accumulation at home
Fish wastages	Dogs/Cats		
Crop residues	Burning		
Used books, newspapers	Food packing/Burning/ Selling		
husk	Cooking fuel		

Source: Authors'transect walk at Piramanthanaru GN division

Pairwise ranking clearly showed that uncertainty about its benefits was ranked firstly. Because their thoughts were compost could be used only for nutrient supply but which would be filled by inorganic fertilizer. Particularly, respondents didn't know about compost is one of the nature's best mulches and soil amendments, earthy material to improves oil structure and creating a healthy environment for plants and etc. Lack of knowledge on compost making was secondly ranked as their major root cause for non-adoption. Hence, every individual should be motivated to reduce uncertainty and adopt for particular innovation. Therefore, during knowledge phase the individual attempts to determine “what the compost

making is and how and why it works". Further, respondents mentioned that in comparison, large quantities of compost were required while small quantities of inorganic fertilizers were needed (third rank) to apply crops. However, all participants were willing to adopt compost making technologies at household level. And participants experienced with the longer decomposition rate, this was proved that the people had not practiced scientific strategies to boost the decomposition rate.

Table 2: The divergent contentions for non-adoption of compost making

	Reasons	**1**	**2**	**3**	**4**	**5**	**6**	**Total**	**Rank**
1	Lack of knowledge	x	1	1	1	1	6	4	2
2	No interest		x	3	4	5	6	0	6
3	Inadequate wastages			x	4	5	6	1	5
4	Needs of large quantities				x	4	6	3	3
5	Time consumption					x	6	2	4
6	Uncertainty of its benefits						x	5	1

Table 3: The suggestion for future adoption of compost making

	Suggestions	**1**	**2**	**3**	**4**	**5**	**Total**	**Rank**
1	Needs of continual training and development	x	1	3	4	1	2	3
2	Presence of local authorities		x	2	2	2	3	1
3	Regular visits of Agricultural instructor/field officers			x	3	3	3	1
4	Introducing home gardening techniques				x	5	1	4
5	Inclusion of waste management in school syllabus					x	1	4

Source: Pair wise ranking of suggestions of respondents in Piramanthanaru GN division

Table 3 shows that, suggestions for future adoption of compost. Presence of local authorities and regular visits of agricultural instructors and field officers were ranked firstly while needs of continual training and development ranked thirdly. In addition to that, introducing home gardening techniques and inclusion of waste management related modules in school syllabuses also were concerned fourthly. Particularly, during focus group discussions (FGD s) the key components for adoption of new innovation (waste management mechanism/organic crop production/ home gardening techniques) were access of information source (Primary school educational system and agricultural extension education) and communication channel between house holds and relevant institutions like municipal council, irrigation department, community based organizations, department of agriculture, seed and planting materials production center and local markets.

Further, focus group discussion proved that, farmers have abilities to come up with solutions to their problems for future adaptation. In order to that, the role of agricultural extension services should be in terms of regular visits of agricultural officers to field, providing agricultural information, facilitating proper communi cation channel between farmers and extension officers, market linkages, relentless trainings and demonstrations. On the other hand, non degradable wastages were rapidly increasing day by day, average seven polybags were being brought home and then it was used for cooking fuel. Which evidenced that, municipal council should pay attention by frequent visits for collection of non-degradable wastages. Participants opined that majority of the food courts in the country used non biodegradable packing materials despite tiny percentage of food courts used environmental friendly packing materials. For instance, traditional food court of department of agriculture, which had been making aware of the usage of biodegradable materials like paper bags, banana leaves, handy crafts and organic stalls.

In addition to that, to complement the adoption of using environmental friendly materials and recycling it, educating primary school children is essential which should raise substantially appreciable adoption level.

Conclusion

The majority of the population depended on agriculture, livestock rearing and one-day laboring work for their livelihood in Piramanthanaru village. Where the improper disposal of waste had become a source of soil degradation and E- wastes significantly accumulated at households due to the absence of local authorities which made serious deterioration in environment. Technical knowledge of the participants by means of compost making was very poor. Significantly, decomposable wastages were being

burnt while no compost making. Majority of households used plastics, polybags as cooking fuel which depicted ambiguity of health hazards. Pairwise ranking showed, lack of awareness on compost application and its importance, uncertainty of compost making methods, and requirements of large quantity compost were ranked firstly, secondly and thirdly as divergent contentions for non-adoption respectively. Attention of local authorities, regular visits of agricultural instructors, field officers and continual training and development were suggested for future adoption.

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