



Title of Thesis: Adoption consequences of solid waste management practices - a case study in Mostafa Agha Village, Abu Hommos District Behera Governorate

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Summary

Many pressures have been Exacerbated on the environment in Egypt, especially with its ever-increasing population, approaching 80 millions, and escalating population density, in addition to changing consumption patterns in rural and urban areas. Among these serious pressures is the problem of the accumulation and spread of solid wastes in many urban areas, and rural areas as well. In rural areas, this problem has led to many environmental and health inconveniences and negative impacts on humans, animals and plants.

Given the changing socioeconomic conditions and modern technologies utilized in rural areas, the majority of rural people are imposed to get rid of considerably large amounts of solid wastes, accumulated over time. This is done by different behaviors including: a) dumping the solid wastes in water canals, and causing, in turn, the detriment of water flow, in addition to the pollution of these canals, or b) burning considerable amounts of these wastes, and causing air pollution. The problem of solid waste management in rural areas is critical in the sense that these wastes, which are mainly secondary agricultural products, could be highly valuable if they are handled positively through recycling. This problem has been addressed by several Governmental and Non-Governmental organizations.

Agricultural extension is one of the governmental organizations interested in facing that problem through raising the awareness of rural people and improving their behavior by adopting the recommended, environment friendly solid waste management practices. This adoption process is affected by several technical, environmental, economic and social factors which must be taken into account when selecting the most appropriate practices for a specific rural community.

The problem of this study is to answer some questions concerning: description and analysis of several aspects of rural households' adoption of solid waste management practices and the consequences associated with that process, whether desirable versus undesirable, or expected versus unexpected.



The objectives of the study were to:

1. Identify the rural households' (RHs) Practices concerning Solid Waste Management (SWMPs),
2. Measure the RHs rate of adoption of some environmentally safe SWMPs,
3. Measure the RHs degree of adoption of SWMPs,
4. Identify the points of view of RHs in relation to the factors affecting their adoption of some environmentally safe SWMPs,
5. Identify the relationship between the RHs degree of adoption of SWMPs and the following characteristics:

a: Quantitative characteristics:

1. Number of RH members,
2. Educational level of R H Head (RHH),
3. Educational level of RHH's spouse,
4. Educational level of R H members,
5. RH occupational status,
6. Participation of R H members in farm work,
7. The RH's land holding size,
8. The RH's farm animal wealth,.
9. The total quantity of crop and animal wastes,
10. Participation of RH members in extension activities,
11. Participation of RH members in community service and development projects,
12. Participation of RH members in village NGOs.

b: Qualitative characteristics:

1. RH's Family type.
2. RHH occupational status.
3. RHH's spouse occupational status.
4. RHH's main occupation.
5. RHH's spouse main occupation.
6. The RH's type of land tenure.
6. Explore the consequences of the (RHs) adoption of (SWMPs).



The study was conducted in Mostafa Agha village, Abu-Hommous District, Beheira Governorate, where the development project called Solid Waste Management in Mostafa Agha village “SWaMMA “.

Several tools were utilized for data collection, including:

- a. A questionnaire through personal interviews with a systematic random sample of 193 RHHs representing 68% of the total number of households in the village.
- b. Focus group discussions conducted with 7 groups representing three main categories of the village population (males, females and village schools’ students). In each category respondents were selected so as to include those who have, and those who have not, attended extension activities concentrating on environmental issues including solid waste management.
- c. Systematic observations of the different indicators of solid wastes accumulation in the village by using a checklist designed for that purpose. These observations were conducted regularly over three years (before, one year after, and two years after the RHs adoption of SWMPs)

Frequencies, percentages, averages, standard deviation, Pearsonian correlation coefficient, step-wise multiple regression analysis and factorial analysis were used for data presentation and analysis. Statistical Packages for Social Sciences (SPSS11) and MS Excel were used for data processing and analysis.

The most important results are as follows:

1. The most frequent RHs practices, concerning SWMPs, were as follows:
 - a. Utilizing rice straw for domestic uses, as practiced by around 64% of the respondents,
 - b. Utilizing maize straw as animal feed, as practiced by around 71% of the respondents
 - c. Utilizing cotton straw for domestic uses ; as fuel in traditional ovens, as practiced by around 57% of the respondents
 - d. Delivering manure to “SWaMMA “,as practiced by 77% of the respondents
 - e. Delivering poultry manure to “SWaMMA “,as practiced by around 79% of the respondents
 - f. Delivering domestic solid waste to “SWaMMA “,as practiced by 92% of the respondents
 - g. Utilizing empty fertilizer’s sacs for rural domestic uses, as practiced by around 97% of the respondents
 - h. Dumping empty pesticides’ containers under the ground, as practiced by around 32% of the respondents



- i. Delivering dead poultry to “SWaMMA “, as practiced by around 42% of the respondents
 - j. Dumping dead bodies of farm animals under the ground, as practiced by around 53% of the respondents.
2. Very low rates of RHs adoption of environmentally safe SWMPs were found. Around 2% only of RHs adopted the composting of the farm solid wastes, and around 3% only adopted transforming farm solid wastes (crops' straw) into non-traditional animal feed.
 3. The majority (around 73%) of the respondents fall in the medium adoption category of SWMPs, compared to 18% and 9% of the high and low adoption categories successively.
 4. The adoption of some environmentally safe SWMPs were found to be affected by the following factors, as reported by RHs:
 - a. Perceived attributes of SWMPs,
 - b. Change agents' efforts,
 - c. Prior practices,
 - d. Characteristics of the RHs and type of SWMPs decision.
 5. As a result of factorial analysis the 11 RHs' quantitative characteristics were reduced/clustered to the following 4 main factors:
 - a. RH economic status, including: The RH's land holding size, The RH's farm animal wealth and The total quantity of crops and animal wastes.
 - b. RH education level, including: Educational level of RHH, Educational level of RHH's spouse and Educational level of R H members.
 - c. RH participation , including: Participation of RH members in extension activities, Participation of RH members in community service and development projects, and Participation of RH members in village NGOs.
 - d. RH occupational status, including: RH occupational status and Participation of R H members in farm work.

Statistically significant and positive correlation relationships were found between total adoption degrees of SWMPs and:

- e. R H economic status ($r = 0.168$),
- f. R H participation ($r = 0.377$),



g. R H occupational status ($r = 0.167$).

Regarding the qualitative characteristics, statistically significant relationships, were found between total adoption degrees of SWMPs and RHH main occupation.

6. The most important observed consequences of adoption of environmentally safe SWMPs were:

- a. Increasing the degrees of cleanliness of the village streets, water canals, and houses' roofs, after the first year. Yet, these degrees of cleanliness were not maintained in the third year. This could be attributed to some conflicts and disputes among the big families which emerged due to the disagreements among these families concerning the control of, and management of the project resources and facilities.
- b. As a result of focus groups' discussions, the majority of the respondents (around 92%) reported that the adoption of SWMPs has environmental consequences. Around 11% reported that the adoption of these practices have economic consequences, whereas 10%, and 9% only reported that they have health and social consequences respectively. Very low proportions of the respondents (around 7% only) reported that they have no consequences.