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assessment and collection of data on post-harvest foodgrain losses

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FOREWORD

The manual is intended to serve as a guide to the statistical methodology for assessing and collecting data on post-harvest foodgrain losses. It should be useful to those countries which plan to launch foodgrain losses reduction programmes but find themselves seriously handicapped because of lack of basic data. I am confident that the manual will go a long way in assisting those who will be charged with the responsibility of planning and implementing surveys for estimating post-harvest foodgrain losses.

The manual, at the request of the FAO, was prepared by the Indian Agricultural Statistics Research Institute. This Institute has a long tradition of developing and testing statistical methodologies as applied to agricultural research and development. A number of its senior officers have served FAO in several projects for the improvement of agricultural statistics in the developing countries. It should, however, be borne in mind that the methodologies suggested in this manual are offered only by way of guidelines which need further study and adaptation to suit the conditions prevailing in specific countries. The issuance of the manual in its present form should be considered as an invitation to the countries to communicate to the FAO their own experiences in this field, particularly taking into account the methodologies suggested therein. The initiation of such dialogue will indeed be very helpful for effecting further improvements in the techniques and methods which could be incorporated in subsequent editions of this manual.

Director
Statistics Division

1. INTRODUCTION

Foodgrain crops need protection in the field from a variety of pests and diseases and natural calamities. The problems do not end with the production of foodgrains which have to undergo a series of operations such as threshing, processing, transportation and storage before they reach the consumer, and there are appreciable losses of foodgrains at all of these stages of their handling and storage. Thus the losses occur at two different stages - the pre-harvest and the post-harvest stages. Information on the extent of losses at these stages is important not only for the scientists and technologists, but it would also be useful to the policy makers, administrators and industrialists. The scientists and technologists would be guided by these findings in carrying out improvements in the crop production and post-harvest technologies aimed at minimizing these losses.

The problem is of greater relevance to the developing countries where the production of foodgrains per head is much less as will be seen in Table 1 given below:

Table 1. Population and production of cereals in different regions*

	Total Annual Production of Cereals (Million tons)	Population (Millions)	Annual Production of Cereals per head (Kilograms)
Developed countries	470	757	621
N. America	274	236	1 161
W. Europe	149	364	409
Oceania	18	17	1 059
Developing countries	414	1 958	211
Africa	45	319	140
L. America	82	324	253
Near East	52	195	266
Far East	235	1 116	210

* FAO Yearbooks on Production

The wastage of foodgrains in the developing countries would, therefore, mean not only monetary loss of billions of dollars but also a decline in their already low nutritional standard and the destabilizing of economy. It is a very distressing situation when all the efforts in the production of more grains in these countries are frustrated by substantial post-harvest losses resulting in failure to meet the food requirements of their hungry millions.

The problem of control or minimizing these losses in the developing countries, where about 70 percent of the population live in villages and depend mainly on agriculture, is much more difficult to solve in the absence of reliable and objective estimates of such losses at different stages. Data on losses in different pre and post-harvest operations would be of considerable value to evolve correct policy to save foodgrains which are becoming scarce and expensive, particularly in the developing countries. At present, such estimates are not available and even if they are available they are simply the intelligent guesses of some experts. This is due to lack of suitable methodology for estimating the losses owing to various causes. The problem of identifying the cause of loss becomes much more difficult when several factors operate simultaneously. For example, at pre-harvest, various pests and diseases occur and cause loss to the crop simultaneously. The methodology for estimation of such losses should, therefore, be based on multivariate approach rather

than taking one or two factors alone into account. Similarly, the metho
tion of losses at the post-harvest stage should consider all the possibl
simultaneously.

The losses at the pre-harvest stage may occur mainly due to pests a
natural calamities like drought, flood, hailstorms, etc. The losses at
stage may occur due to faulty methods of harvesting, threshing, cleaning
transportation, processing, packaging, distribution of foodgrains etc.
manual will, however, be concerned with the losses occurring at the p

The seriousness of the problem of post-harvest foodgrain losses has
numerous meetings, conferences, symposia, etc., at national as well as i
Many studies for assessing the post-harvest losses have been conducted b
particularly in the developed part of the world. Several international
considerable interest in such studies. The FAO Council at its Seventy-f
from 6 to 17 June 1977, discussed the problem of post-harvest losses and
by the member countries that there was a lack of definitive loss data in
together with the need to conduct loss surveys before launching loss red
They also felt that for conducting such surveys on an objective and scie
was a need to develop a statistical methodology for the collection and s
ment of data on post-harvest food losses. Consequently, the Indian Agri
Research Institute, New Delhi, whose main function is to conduct researc
statistics, was asked by FAO to review the available literature on post-
losses and suggest suitable statistical methodology for the collection o
losses, taking into consideration the special conditions prevailing in t
countries with particular reference to wheat, rice, corn, sorghum and mi

To achieve the above objective, the first task was to study the wor
experts and agencies in this line so that the problems posed by the FAO
and suitable studies formulated to develop appropriate statistical metho
in view the conditions obtaining in different countries, particularly th
In this connection, various specialists and organizations were contacted
through correspondence. The names of these specialists and organizatior
either by supplying materials or giving references are given in Appendix

Only reports and proceedings, etc., which have been referred to are
of references. Articles by individual authors are numerous and since m
been referred to in those reports/proceedings, they have not all been in
has been made to review all available literature on the subject publishe
decade. It is, however, not claimed that the review is exhaustive; onl
as was available to the authors has been referred to in this manual.

After going through the material mentioned above it was observed th
cepts, definitions and measurement techniques have been used in differer
therefore, felt necessary to develop some kind of concepts and definitio
appropriately used while collecting data on foodgrain losses.

The statistical methodology has been presented in Chapter 3. In Ch
tions made have been given in brief. The references made in the text ar
The specimens of questionnaires, other forms, etc., to be used in the as
tion of data on post-harvest foodgrain losses are given in the Appendice