# 4 Introduction to Findings

## *4.1 The Theory of Reasoned Action*

The theoretical construct applied to the analysis of both the 'before' and 'after' surveys is based on the 'Theory of reasoned Action' (Ajzen and Fishbein 1980). The Theory of reasoned Action (TRA) has been applied extensively in other disciplinary fields, such as public health, nutrition, agriculture and forestry to explore the cognitive decision-making processes of different social groups. It is acknowledged as one of the most reliable theoretical approaches of understanding the cognitive construct underpinning the decision making process .

"As the name implies, the theory of reasoned action is based on the assumption that human beings usually behave in a sensible manner; that they take account of available information and implicitly or explicitly consider the implications of their actions….. the theory postulates that a person's intention to perform (or not perform) a behaviour is the immediate determinant of that action. Barring unforeseen events, people are expected to act in accordance with their intentions" (Ajzen 1988: 117). The theory is therefore primarily concerned with identifying the factors underlying the formation and change of behavioural intent (Fishbein and Manfredo 1992). Intention, in turn, depends on two independent factors – their own attitude, and the subjective norm. Attitudes depend on beliefs regarding the outcomes of performing this behaviour, and the values attributed to these outcomes. A person's subjective norm (perceived social pressure) is a function both of their normative beliefs regarding how they feel 'important others' would expect them to behave, and their motivation to comply with these "others". Therefore in order to change behaviour it is necessary to change either the pertaining attitudes and / or subjective norms by changing the corresponding underlying beliefs. The following figure summaries the TRA.

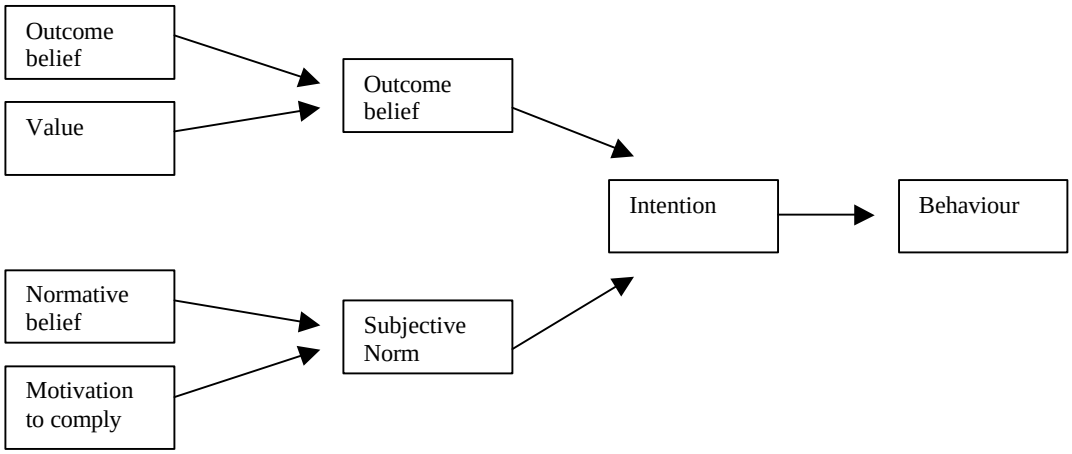



**Figure 1: A schematic presentation of the Theory of Reasoned Action**

The TORA is explained best understood as a series of hypotheses linking (1) behaviour to intentions, (2) intentions to a weighted combination of attitudes and subjective norms (social referents), and (3) attitudes and subjective norms to behavioural and normative beliefs. If one accepts the causal chain illustrated in the diagram, it follows that behaviour is ultimately determined by one's underlying beliefs. Therefore changing behaviour is primarily a function of changing this underlying cognitive structure. The TORA rapid assessment tool is a means to capture the strength of the underlying beliefs and social referents for a particular behaviour and thus provide valuable information for constructing and targeting educational and physical interventions.

The strength of the relationship between the variable constructs within the theory is normally measured using the correlation coefficient. The multiple correlation coefficient ( R ) serves as an index of the extent to which behavioural intention can be predicted from the simultaneous consideration of the attitude and subjective norm. This approach demands the use of parametric statistics, however there is concern regarding whether some of these variable scales can be treated as parametric measures (i.e.

of equal interval). In the light of this a non-parametric approach has been applied in this analysis as was the case with the initial survey. The Spearman Rank Order Correlation has been applied to identify the differences in the contribution or influence of the attitude and subjective norm on the intention. Others have applied this non-parametric approach to the TORA model in field contexts (e.g. Tait 1983, Carr et al. 1991 and McKemey 1996).

### *4.2 The measurement of the main variables*

The **behaviour** is measured by calculating the sum of ten activities that are considered important to the achievement of the particular behaviour, (i.e. a range of -10 to +10). The measure of behaviour is developed by identifying whether each of these related practices have been undertaken in the recent past.

The respondents strength of **intent** to perform the focal behaviour in the near future was measured on a 5 point bi-polar scale, i.e. very weak (-2) to very strong (+2).

The attitude is measured by first identifying the most **salient outcome beliefs** common to the community in question. Measures are then taken for each of the salient outcome statements against a 5 point bi-polar scale regarding their 'agreement' (belief) with the particular outcome and a similar measure of the 'importance' (value) they attribute to each. The product of the individual outcome belief and value measures (b*e) are then added to give the overall attitude reading ($\mathbf{\Sigma b_i * e_i}$). For each of the behaviours a list of 20 salient outcome beliefs was addressed. (Therefore when 20 outcome belief statements are used to measure attitude the possible response score ranges from -80 to +80. In the case of stoves this was reduced to 15 outcome statements, i.e. a possible range of -60 to +60). In the application of the second survey, the same sets of salient outcome beliefs were applied as in the first survey. It is understood that the salient beliefs may change over time, i.e. other issues of importance coming to the fore. However, in order to make a before and after comparison it was felt the reapplication of the original salient belief sets was the most appropriate.

The individual outcome (b*e) products are correlated separately with the stated intention so as to identify those that have most **influence on the decision making process**. The direction of the outcome belief, i.e. whether it supports the proposed behaviour or not and the positive or negative nature of the attributed belief and value indicate whether the particular influential outcome attitude acts as a 'barrier' or promotes (drives) the adoption of the behaviour in question.

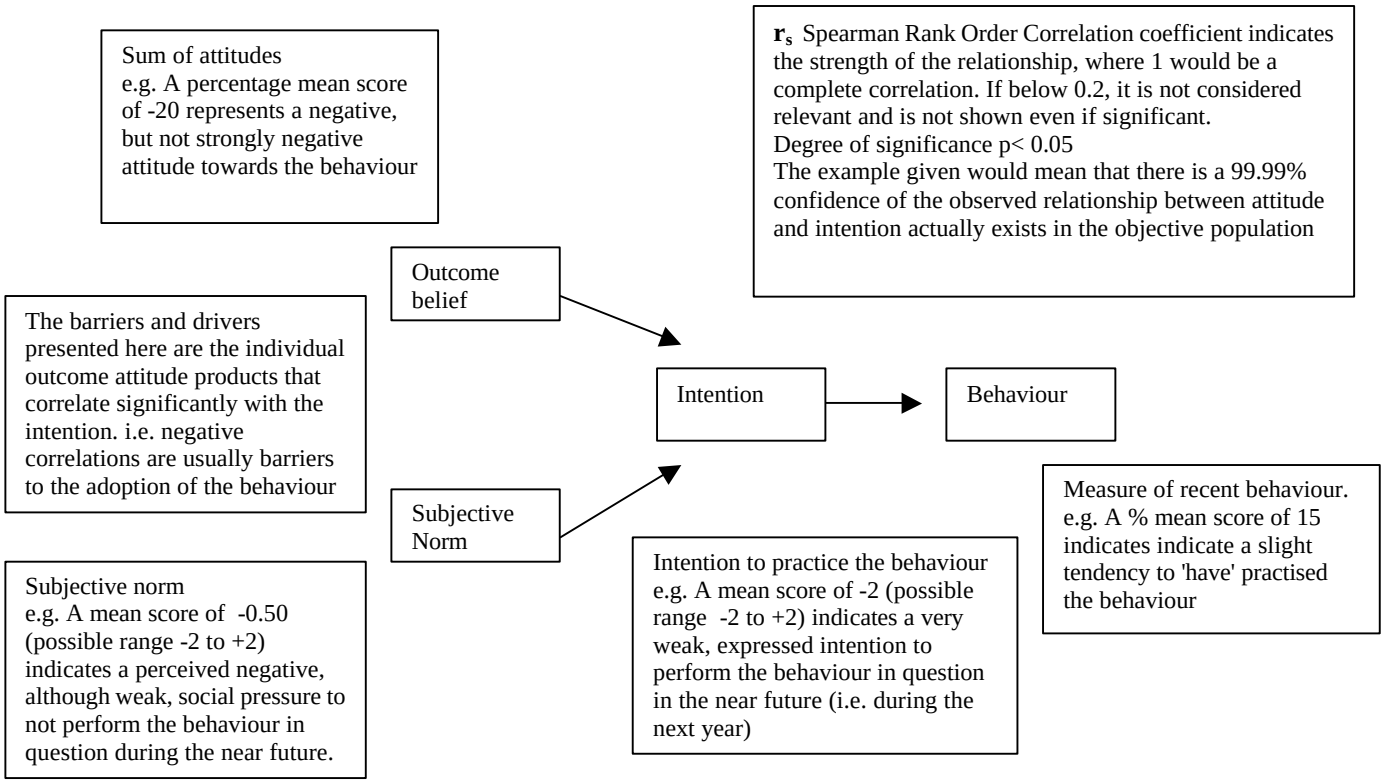
A similar approach is taken to the measurement of the **subjective norm**. A list of 6 pertinent social referents regarding each behaviour was established before the first survey. These social referent sets were reapplied in the second survey. The product of the subjective belief (b) and motivation to comply (m), regarding each of the identified pertinent social referents is calculated (b*m). Both (b) and (m) are measured on 5 point bi-polar scales. The sum of these products is the taken to represent the subjective norm, i.e. ($\Sigma m_j * b_j$) presenting a possible range of response between -24 and +24. An alternative open measure of the subjective norm is also applied. The respondents were asked to indicate the strength of their response on a similar 5 point bi-polar scale to the following question: 'How likely is it that the people you most respect think you should perform the specific behaviour?' (The possible range of response regarding the 'open' measure of the subjective norm is -2 to +2.) In the case of this analysis, the response to the 'open' question has been used as a measure of the overall subjective norm. However, the individual referents' normative measures are also taken into account, e.g. the normative belief and motivation to comply product (b*m) regarding the extension agent. The strength of these individual referent products are taken to indicate the influence of these on the overall subjective norm ($\Sigma m_j * b_j$) but not necessarily on the open measure of the subjective norm.

### *4.3 Understanding the analysis*

The following sections present the findings. The key comparison between first (before intervention) and second (after intervention) surveys are summarised in the text and diagrams. Comparisons of with and without extension activities within the second survey are also presented, as are with and without demonstrations. It should be noted that the relevance of the demonstrations question varies with the three behaviours and is noted in the text.

We recognise that the TORA is unfamiliar ground to many of the potential readers of this report. In order to assist the reader to understand the analysis this section presents an example of "How to read the diagrams". In this report 3 different general behaviours related to fuel wood management have been addressed, improved stove adoption, firewood collection and wood lot planting. If undertaken each is a considered positive contribution to improved natural resource management. In the following "guide to reading the diagrams" the 'behaviour' has not been specified but is assumed to be positive and it's increased adoption the aim of any extension and /or educational intervention.

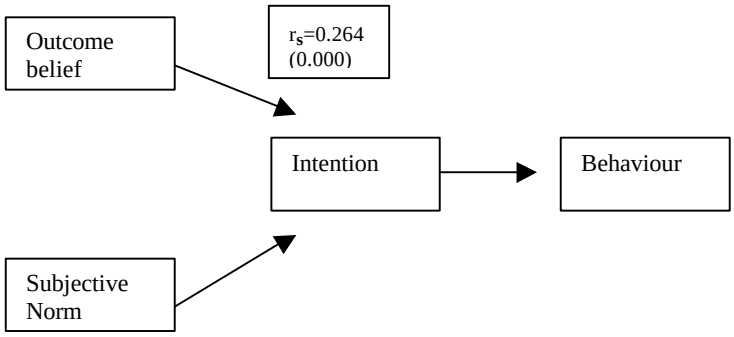
#### 4.3.1 Stage 1: Measurement of the different TORA components




#### 4.3.2 Stage 2: Identifying and comparing the relationships between the TORA components.

In addition to the presented means, the diagram presents the strength of relationship or influence of the different components of the TORA on each other. The arrows demonstrate the direction of this relationship, e.g. attitude on intention. The strength of the relationship is measured by the comparing the statistically significant correlation coefficients between the different component of the TORA, e.g. between the attitude vs. intention and subjective norm vs. intention correlations. For example if the

attitude vs. intention correlation coefficient was found to be stronger than that of the subjective norm's correlation with intent, it would be assumed that the subject's attitudes have greater influence on their decision to adopt the behaviour in question.



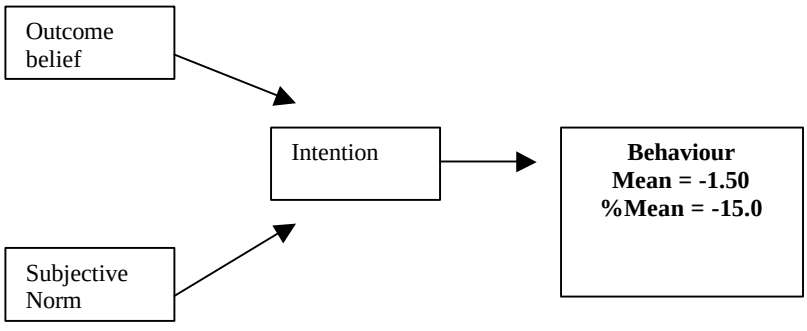

### 4.3.3 Stage 3: Reading the impact of an education intervention on the TORA components

In the following presentation of the findings, three different comparisons are made all related to a before and after comparison, i.e. first (before) and second (after) survey samples, without and with exposure to extension and those who have or have not attended demonstrations. The identification of the influence of time alone is identified by comparing the 'first' survey sample with those who have not been exposed to extension. In the following example a 'with' and 'without' extension scenario is presented

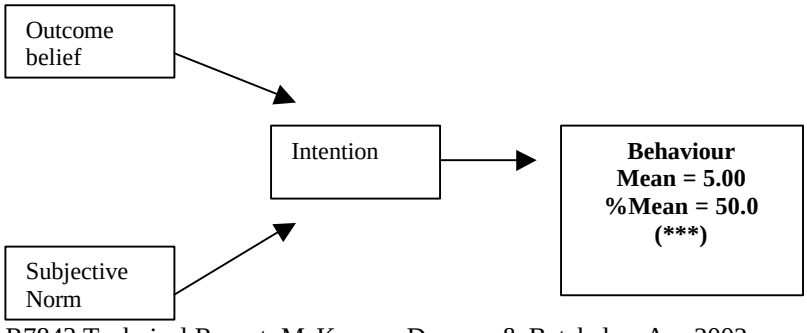
The significance of the changes that have occurred in the component readings due to, for example, exposure to extension initiatives, are identified by comparing the mean scores using the Mann Whitney 'U' Test. In the second diagram of each comparative set, the significance of the change in the mean values of the different components are noted by a series of stars, i.e. * p = <0.05, ** p = <0.01, *** p = <0.001).

**Comparative partial diagram (3) demonstrating a 'with' and 'without' example of behaviour change:-**

'Without' extension




'With' extension



In the diagram above, the difference in the means between those without extension and those with extension suggests that the practice of the specific behaviour in question has increased due to exposure to extension interventions. The statistical significance of this increase in the practice of the behaviour is denoted by the three stars (***) in the 'with extension' example, i.e. indicating a 99.99% confidence that this change is representative of the populations under investigation.

This statistical validation of the changes is an important element of the process. If the two mean readings for behaviour had been -1.50 ('without' extension) and +0.60 ('with' extension) and this change would not proved significant (NS). Therefore we might consider that some positive change in behaviour had occurred but would not be able to claim with any degree of confidence that this change in behaviour is representative of those exposed to extension when compared to those who have not been exposed[4].

#### 4.3.4 Stage 4: Reading the changes in the relationships between the TORA components as a result of an education intervention

The change of the relationship or influence of one component on another is observed by comparing the 'without' and 'with' correlation coefficients (if significant). The comparative example below indicates that the correlation between attitude and intention is stronger in the case of those 'with' extension exposure. This suggests that the influence of the subjects' attitudes on their intention to perform the behaviour has increased.

When the correlations of the subjective norm with intention is observed in the case of those 'without extension' and those 'with' it is noted that it has weakened to the point of none significance (NS) in the case of those 'with' extension. In this case the assumption is that exposure to extension has weakened the influence of the subjective norm on the subjects' intention to perform the behaviour.

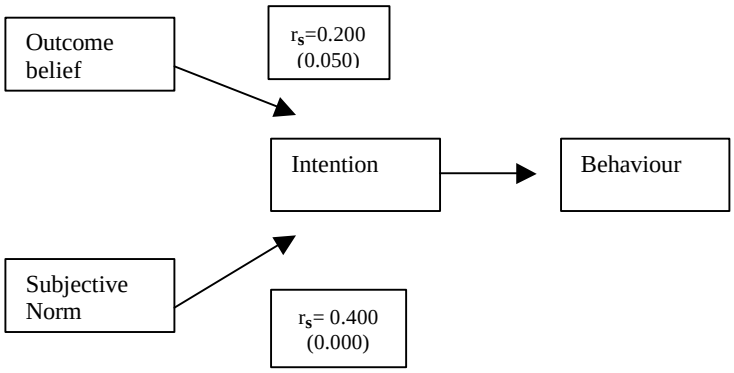
In the case of those 'without' extension, when the correlations of both the attitude and subjective norm with intention are compared -see below-, it is observed that the relationship between the subjective norm and intention is the stronger one. Therefore, in the case of those 'without' extension exposure it is assumed that the social normative pressure has a greater influence on the subjects' decision to undertake the particular behaviour in question.

In the case of those 'with' extension, the correlation between attitude and intention in the example below is the dominant relationship. In this case it assumed that the extension intervention has led to the subjects' attitude having greater influence on their intention to adopt the behaviour in question. If the intention to perform the desired behaviour has increased in the case of those 'with' extension and the attitude toward the behaviour has similarly increased positively in strength, it could be assumed that the more positive attitude has resulted in the stronger expression on intent to perform the behaviour. Similarly if the subjective norm in the case of those 'without' extension correlated with a weaker or negative expression of intent, then the exposure to extension could be assumed to have weakened the negative normative influence regarding the performance of the particular behaviour.

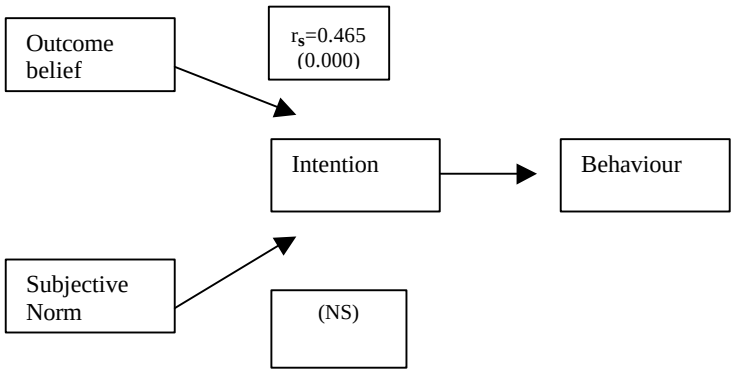
[4] The statistical ability to demonstrate the significance of the changes in the components which influence the subjects' reasoning regarding the adoption of different behaviours gives the TORA model findings a greater degree of confidence when compared to many of the other qualitative approaches.

**Comparative partial diagram (4) demonstrating a 'with' and 'without' example change in the influence of attitudes and subjective norms on intention:-**

Without Extension




With Extension




### 4.3.5 Stage 5: Identifying the cognitive 'barriers' and or 'drivers' influencing the intention to adopt the behaviour

The overall attitude to a specific behaviour is measured by taking the sum of a number of specific outcome attitudes. A cognitive barrier or driver is an attitude, either negative or positive regarding a specific possible outcome resulting from the subjects' performance of the behaviour, which correlates significantly with the subjects' stated intention to perform the behaviour in question. The direction of the correlation indicates whether the specific outcome attitude is acting as a barrier or driver.

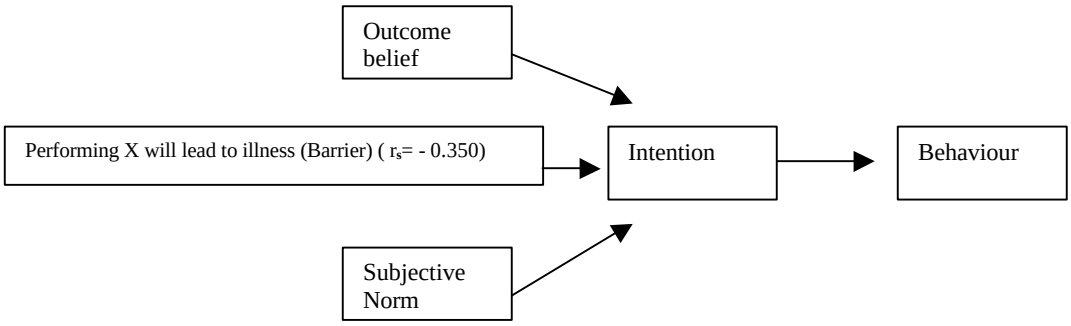
In the example below in the case of those 'without' extension exposure, the specific outcome that was found to correlate most strongly with the subjects' intention to perform the behaviour was concerning the subject's belief that the performance of behaviour X would lead to illness. This outcome attitude is considered a cognitive 'barrier' as it correlated negatively with the positive although weak expressed intention to perform behaviour X.

In the case of those 'with' extension exposure the outcome attitude regarding the performance of X leading to improved health, was found to correlate positively with the subjects' stronger intention to perform X. This outcome is therefore considered a driver influencing the more positive intention of those exposed to extension. Therefore it could be assumed that the extension intervention changed the subjects' attitude regarding the influence on their health of performing the behaviour from a negative to positive perception, thus increasing the likelihood of their adopting the behaviour in future. If the

extension intervention deliberately targeted the subjects' previous outcome beliefs regarding the behaviour leading to ill health, the result after exposure to the extension intervention is demonstrated below.

**Comparative partial diagram (5) demonstrating a 'with' and 'without' example change in the barriers and drivers influencing the subjects' intention to adopt a specific behaviour:-**

'Without' extension




'With' extension