A SURVEY ON STRATEGIC OPTIONS FOR THE RESUSCITATION OF THE NATIONAL TOBACCO OUTPUT TOWARDS THE ASSUMED ZIMBABWE POTENTIAL OF THE YEAR 2000

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ABSTRUCT

Tobacco has been a major contributor to Gross Domestic Product (GDP) in the Zimbabwe economy, at its peak contributing 12% of GDP (Tobacco Industry and Marketing Board 2004). Its annual output has declined from the year 2000 production of 237 million kilogram to its lowest output of 48, 8 million kilogram of 2008. While the decline has been a national concern and efforts to resuscitate the output show improvement with 2010 production at 123 million kilogram (52%), deliberate strategies need to be put in place to identify and correct the output constraining factors. The study, aimed at addressing yield as one of the established factors known to inherently have a positive correlation of r = 0,8 with output (TIMB 2010). From the four tobacco growing provinces of Zimbabwe, two provinces were purposively selected for the study and quota sampling of twenty respondents per province was done. A structured questionnaire was then administered by the researchers. Using excel, applying Pearson correlation (r) the study confirmed that yield as the main driver of output had positive correlations to three aspects of: experience of the grower, farmer scale of operation and level of variable costs invested per hectare. As a strategy to resuscitate output towards its national potential (237 million kilogram based on year 2000 bench mark), it is recommended that: tobacco training programmes be put in place, growers be capacitated to increase scale of operation and adequate funding be availed to achieve a level of variable cost adequate for target yields which are capable of achieving set national output.

Key words: Farmer felt needs, Yield per hectare, National tobacco output.

INTRODUCTION/BACKGROUND:

Zimbabwe economy is agro-based, Tobacco Industry and Marketing Board (TIMB 2004) is quoted estimating tobacco contributing 12% of Gross Domestic Product (GDP) at the peak of its production. Maravanyika (1998) emphasizes the value of tobacco to Zimbabwean agriculture when his works confirm that tobacco offers returns seven times higher than the next best crop. National annual tobacco output is of economic importance to the local market which consumes 3%, while 97% of the crop is destined for the export market where it is preferred for its high quality and unique flavour used for blending filler tobacco from other tobacco producing countries. At its highest output, Zimbabwe tobacco registered 237 million kilogram in the year 2000. Interesting statistics are related to this record high output. This was produced from 84 857 hectares, by 8 537 growers who achieved a national average yield of 2 792 kilogram per hectare. An unprecedented decline ensued thereafter with decline in national output recording its lowest in 2008 when a 48,8million kilogram of the crop was produced. Equally eye catching are the related drivers to this low output. From an area of 61 622 hectares, 35 094 growers (4 times more than year 2000) attained an average yield of 792 kilogram per hectare, (TIMB 2009). A technical relationship has produced a predictive pattern between yield attained (kilogram per hectare) and the associated national output of tobacco achieved in any one season. Table 1 below highlights the critical area of concern related to decline of national output from the year 2 000 down to 2008. Growth in grower base from 8 537 in 2 000 up to 51 685 by the year 2010 (6 times) related to the decrease in average national yield from 2 792kg per hectare for the year 2 000 down to 1 842kg per hectare in 2010 provided a negative correlation co-efficient (r) of -0,86. This revelation therefore, exposes the false virtue of impressive high farmer registrations showing that, growth in the number of growers has no edifying role to raising national tobacco out put. After all, structure of the potential tobacco growers reflect 80% being derived from small holder sector each growing one to two hectares (TIMB 2010). There is need to address the felt needs of this class of farmers in order to improve yield. They face a limited command over

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suitable land for tobacco for them to improve their scale of operation. They have limited experience and a higher training need coupled with limited capacity to raise the required investment capital as they have no collateral to secure bank funding. Contracting tobacco merchants given an option prefer dealing with large scale growers as a rational business decision to reduce transaction costs associated with small scale growers Coulter J, et al (1999).

Table: 1 Trend of annual tobacco output relative to yield/hectare, total number of growers and total area cultivated.

Year	Number of growers	AREA (Ha)	Yield/hectare (Kilogram)	Annual output (million Kilogram)
2000	8 537	84 857	2 792	237
2001	7 937	76 017	2 664	202
2002	14 363	74 295	2 213	166
2003	20 513	49 571	1 673	82
2004	21 882	44 025	1 565	69
2005	31 761	57 511	1 300	73
2006	20 565	58 808	943	56
2007	26 412	54 551	1 339	73
2008	35 094	61 622	792	49
2009	29 018	62 737	934	59
2010	51 685	67 054	1 842	123
Correlation to Output (r)	- (0,86)	0,85	0,96	

Source: TIMB Annual statistical report 2010.

From the above Table 1, a positive correlation co-efficient (r) of 0, 96 between yield per hectare and national output in the years reviewed was confirmed. Evident also is positive correlation co-efficient (r) of 0,85 relating area cultivated to national output. FAO (2003) also observed the same effect of increase in national out put being attributed to increase in yield for Brazil, China and India. Brazil was noted to have experienced production increase of about 3,5% per year over the last 25 years. This was mostly attributable to yield increases of 2-3% per year and less to growth in area harvested which contributed 0,8% per year. Brazil yield improvement is further attributable to improved varieties which factor compared to the Zimbabwean challenge may no longer be an issue. Tobacco Research Board (TRB) is far ahead of current farmer yields with commercially released varieties like T66 yielding as high as 4 000kg per hectare when national average yield is still 1 842kg per hectare (TIMB 2010).This fact was also echoed by Zimbabwe Tobacco Association (ZTA Jan/mar 2010). India's increase in tobacco production has been as a result of increasing yields from 810 kg per hectare in 1970/71 up to 1 395 kg per hectare by 1997/98. (FAO2003) This great improvement was also noted to have come about as a result of deliberate Government interventions in support of tobacco industry in the form of Research and Development as well as direct fertilizer and credit subsidies raising an added dimension Zimbabwe may do well to evaluate its self on these factors. Coudy et al (1991) highlighted emphasis related to policy support of prominent tobacco producing nations where Zimbabwe was also ranked. Table 2 below exposes critical yield driving factors that are believed to be policy issues and have been actively facilitated at national level

Table: 2 Policies supported affecting tobacco production.

Policy Instrument	Argentina	Brazil	India	Japan	Turkey	U.S	Zimbabwe
Domestic price support			x		X	X	
INPUT ASSISTANCE							
Fertiliser subsidy		X	x		X		
Credit subsidy		X	x		X	X	
Fuel subsidy		X				X	
Irrigation subsidy			X				
Infrastructure		X	X				
Research and Extension		X	x		X	X	X
Irrigation construction			x			X	
Farm mechanization							
Pest and disease control							X

Source: Coudy, Pompelli and Grise

Zimbabwe the fourth largest producer after Brazil China and India is noted to have taken interest in supporting Research and Extension only. Zimbabwe enjoys comparative advantage fulfilling a unique market niche that is quality based from its tobacco flavour. This attribute is highly related to high yield and continued yield decline is potentially bound to reduce quality of Zimbabwean tobacco to a filler tobacco on the world market. Deliberate policy support is therefore an imperative as there is an over supply of filler tobacco on the world market and Zimbabwe is not best qualified to comparatively compete in this class as she has no capacity to push the requisite volumes at par with Brazil, China and India. From the above exposition, it may be deduced that the key driver for attaining a high annual tobacco output is not related to increasing the grower base, nor opening up more land for tobacco cultivation but in increasing yield per unit area of land as was also noted by Gittinger, Leslie and Hoisington (1988). If national tobacco output is to be revived to its year 2000 bench mark of 237 million kilogram, it is therefore imperative that key yield drivers be identified and strategies for addressing them recommended for implementation.

PROBLEM STATEMENT:

Zimbabwe national tobacco output has declined from its bench mark of 237 million kilogram in the year 2000 to its lowest out put of 48.8 million kilogram in 2008. This yield decline is related to a corresponding decline in average yield from 2 792 kilogram per hectare of the year 2000 down to 792 kilogram per hectare by the year 2008 (Table 1). Analysis of yield relative to National tobacco output for the years covering this period has a high positive correlation co-efficient (r) of 0.96, therefore, to resuscitate tobacco output, there is need to raise yield to its bench mark level of the year 2000. It is therefore necessary to identify aspects with positive correlations to yield so that these aspects if addressed will result in increase of output.

RESEARCH OBJECTIVES:

To identify factors with a positive correlation for high yield level attainment for tobacco farmers. To recommend yield based driving options available for resuscitating national tobacco output for Zimbabwe to its bench mark of the year 2000.

JUSTIFICATION:

Zimbabwe agricultural contribution to Gross Domestic Product (GDP) is largely based on the relative tobacco annual output. At its best, the tobacco output of the year 2000 of 237 million kilogram has been denoted as the national tobacco output potential (bench mark). Tobacco annual output steadily declined from this potential. While an upward trend is hopefully regenerating, rising to 123 million kilogram in 2010 (52% of potential), 132,4million kilogram in 2011 (55, 9% of potential), it is vital and pertinent that key factors for resuscitating annual tobacco output be identified and addressed. Unit area yield improvement being one of these key drivers with a positive correlation co-efficient $r = 0, 96$ with output, deserves to have its constraints confirmed and given due attention. This study hopes to link the known literature ideals for tobacco yield improvement with farmer felt needs within the Zimbabwe tobacco sector environment in order to confirm the related constraints and recommend some of the possible options for adoption by tobacco farmers. Zimbabwe's world tobacco niche market is endowed on its quality and flavor both of which are yield related. Low tobacco yield compromises both quality and national output.

MATERIALS AND METHODS:

The study covered the two tobacco growing Provinces of Zimbabwe namely Manicaland (Rusape altitude 1695m and mean summer temperature of 26^0 C} and Mashonaland Central (Bindura altitude 1550 m and mean summer temperature of 28^0C) while the other two provinces namely, Mashonaland East and Mashonaland West were excluded. All the four provinces fall under Zimbabwe agro-ecological zone IIa receiving annual rainfall of 800mm to 1 000mm.

SAMPLING TECHNIQUE:

Multi-stage sampling technique was applied, with two tobacco growing provinces being purposively included to ensure that Manicaland province represented the slow ripening area while Mashonaland Central covered the medium/ fast ripening areas. Stratified quota sampling was then adopted with each province constituting a stratum having a quota of twenty growers selected. A total of forty respondents were then interviewed using a researcher administered structured questionnaire.

DATA COLLECTION:

The survey was carried out from November 2009 up to August 2011. The researchers had farmer respondents' contact in the field for two seasons and monthly visits to the three auction floors centralized in Harare (Tobacco Sales Floor, Boka Tobacco Sales Floor and Millenium Tobacco Sales Floor), during April to August 2011 which provided a more cost effective strategy for relating to all Zimbabwean tobacco farmers from a central point.

RESULTS AND DISCUSSION:

Table: 3 Farmer Responses. Manicaland ProvinceMashonaland Central Province

Respondent	Yrs experience	Scale (Ha)	V/Costs USD/Ha	Yield (Kg/Ha)		Yrs Experience	Scale (Ha)	V/costs (USD/Ha)	Yield Kg/ha
1	1	2	2000	2200		2	2	1200	1500
2	1	2	1000	1560		1	1	1000	1200
3	1	2	1200	1300		2	1	400	1000
4	2	3	1500	1450		4	1	1100	1900
5	2	1	700	1080		3	2	1500	1600
6	3	1	1200	1360		2	2	1000	1000
7	15	18	8000	3800		18	3	1500	2000
8	12	20	8500	3460		3	2	800	1500
9	2	14	1800	2400		5	1	600	1500
10	2	2	1200	1000		4	3	1700	1800
11	3	5	1800	2000		12	30	2900	2800
12	1	1	670	800		6	15	3000	3250
13	1	1	1100	980		24	3	4800	3400
14	2	1	800	1200		1	10	6000	2450
15	1	1	1400	1360		1	1	1080	1000
16	1	1	1050	1180		7	6	2400	2500
17	3	10	2850	2600		2	1	1600	1400
18	12	14	2800	3100		3	4	1800	1880
19	2	1	950	1050		1	1	1050	900
20	1	2	1200	1100		3	2	680	800

Source: Research data 2009-2010

Table: 4 Correlation co-efficient (r) (Pearson)

Aspect	Mashonaland central	Manicaland Province
Farmer's Experience vs Yield attained	r = 0,669	r = 0,861
Scale of operation (Ha) vs Yield attained	r = 0,613	r = 0,936
Level of Variable costs vs Yield attained	r = 0,781	r = 0,868

Average tobacco yield for the sample Provinces were 1769 kilogram per hectare for Manicaland and 1 749 kilogram per hectare for Mashonaland Central. Relating these confirmed yields with the national average yield of the year 2000 (2 792 kg/ha) it is noted that only 66% of potential yield was achieved. To raise yield, it therefore becomes pertinent to address the above issues.

TOBACCO GROWING EXPERIENCE:

Experience as measured by the number of seasons that a farmer has been exposed to tobacco culture confirms the view that agriculture is both a science and an art. With more years of growing the crop farmers develop skills and are empowered to make better informed decisions for most challenges. The study noted that, 75% of respondents had five years or less of tobacco growing in line with 80% noted (TIMB 2009). This attribute had a positive correlation r= 0,669 for Mashonaland Province while Manicaland Province had r=0,861 with yield. Moris J (1991) noted the role of extension training in shortening the farmers learning curve related to innovations adoption and experience building. In support of this principle, Tobacco Research Board (TRB) conduct annual road shows before the beginning of each season which are meant to raise farmer awareness on potential challenges they are poised to face during the season ahead. Key issues exposed during these road shows, naturally would form the basis of the annual training programme of farmers by stakeholders which needs to be taken seriously. In support of this TRB strategy, Moris J. (1991) singled out attention to farmer training needs as an essential for shortening the learning curve for highly technical crops like tobacco. He emphasized the value of regular programmed training sessions for extension staff and connected this to benefit farmers when adopted using the Training and Visit system (Tand V) that was developed by the World Bank consultant Daniel Benor. New growers would therefore benefit from this approach that grills them stage by stage into the management demands of the crop until they develop competences through adoption of yield enhancing practices.

SCALE OF OPERATION:

Tobacco Industry and Marketing Board (TIMB) ranks all growers cultivating five hectares and below as small-scale while those cultivating above five hectares are large scale. The study noted that 80% of growers were small scale in line with the nationally confirmed statistic (TIMB 2010). This element was evaluated and its correlation was positive to yield with MashonalandCentral Province recording r = 0,613 while Manicaland province had r = 0,936 relative to yield. This factor is based on rational business decision making, any investor who expands business, takes care that most related challenges are addressed particularly issues of appropriate funding (level of variable costs per hectare) and training. While scale of operation is positively correlated to high yield, the risk of high yield also exposes any investor to larger losses. Gittinger P (1996) relates this to technical considerations where economic rationale guides any expansion only to be done relative to available resources. The positive relationship of improved average yield per hectare relative to increase in scale of tobacco cultivated draws attention to the need to empower growers to increase production capacity per grower rather than enlisting more small-scale growers. These small-scale growers need more training and have limited capital for operational and development needs. Once a tobacco farmer is adequately capitalized, inherently he is exposed to the risk of underutilization of the acquired mechanical assets and infrastructure if corresponding level of operating capital is not availed to cover variable costs. It is therefore imperative that capital adequacy including repairs and maintenance are balanced so that targeted crop yield is not unnecessarily compromised midseason when a limiting factor, unexpectatedly forms the weakest link. Each scale of operation adopted demands an appropriate scale of funding to facilitate adequate support to achieve target yield. Policy support considerations should be put in place to facilitate this aspect by all stakeholders, Government included.

PRODUCTION COSTS PER HECTARE:

Production costs were noted to be highly correlated to yield with Mashonaland province recording r = 0,781 while Manicaland province had r = 0,868. Essentially, this aspect of variable costs needs to be discussed in relation to source of funding. Three sources of funding were noted as: self funding, bank loans and contract system. Table 5 below shows the relative funding pattern.

Table: 5 Farmers funding pattern

Source of funding	% of farmers involved
Self	65
Banks	10
Contractors	35

Self funding with all its associated limitations for a high capital demanding crop like tobacco had 65% of growers. During the year 2010, recommended costs of production were USD 8 000 per hectare (TIMB 2010). Related to both level of variable costs per hectare and scale of operation, the self funding mode appears in appropriate for a highly capital intensive crop of this nature. Commercial bank support was noted as 10%. Commercial banks only advance loans in appreciation of collateral security provided. Zimbabwe's current land tenure system has reduced agricultural land to a state of no collateral security value. This has restricted the farmers' capacity of access to Commercial banks as a source of funding for tobacco production. Contract system supported 35% of growers. While this option may be poised to expand, its limitation has been largely criticized for neglect of funding capital items. Adequacy of seasonal funding against a weak capital base aborts a potentially promising crop as often happens, quality leaf tobacco is lost when barn space is limited due to a ripening flash or due to leaf rot associated to need for repairs of leaking barns. Capital funds need to be availed for providing due attention to tobacco barns and indeed, any capital item that may be noted as the weakest link in the production chain.

CONCLUSION AND RECOMMENDATIONS:

Aspects of level of farmer experience, scale of operation for individual farmers and level of variable costs per hectare invested are all factors which have a high and positive correlation to yield and are capable of raising yield which impacts on national output. These three aspects need to be addressed to improve yield for national output to be resuscitated towards the year 2 000 bench mark of 237 million kilogram.

A deliberate skills empowerment strategy through a sound training programme is essential to cover-up the experience gap by shortening the learning curve. Multi-faceted training effort by all stakeholders inclusive of Commerce, Tobacco industry, Government Extension systems and tobacco contractors may yield the desired synergy as training is an expensive investment whose fruits accrue not only in future but are there for everyone to enjoy.

To increase national output the established grower base should be capacitated to raise individual scale of operation, rather than perpetuating the increase in grower base on a small scale. Capacity building strategy to encompass a sound

training programme that is reinforced by a balanced package of working capital, repairs and maintenance, as well as capital development support to each grower.

Adequate funding be facilitated to be availed from all potential sources through a government policy framework to avail funding to farmers at the recommended levels. Both commercial Banks and Tobacco contractors need to advance the appropriate level of funding to cover variable costs adequate for the recommended yield.

ACKNOWLEDGEMENTS:

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