PROSPECTIVES FOR GROWTH : A SYSTEM DYNAMICS STUDY OF THE ROMAN CATHOLIC PRIEST POPULATION OF THE NETHERLANDS

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Abstract

Sponsored by a Dutch Roman Catholic Foundation a System Dynamics computer simulation model has been developed to study the population dynamics of priests of the Dutch Roman Catholic Church.
Few vocations since the second half of the sixties led to a disproportional 'going grey' of the priest population. This is manifested not only in the unbalanced age structure but also in a relatively high number of retirements.
The model (see enclosed flow diagram) structures on the one hand the physical demographic processes and on the other embodies a theory based on observation of qualitative aspects of disaggregated priest, believer and non-believer populations. Church attendence figures for instance are used as a measure of vocation potential.
The model is used to articulate the insights on the influence of policy alternatives on priest population in the coming 50 years or so.

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HISTORICAL INTRODUCTION

The paper discribes work done on a System Dynamics Study for a private foundation interested in providing information and documentation concerning the Roman Catholic Church in Holland. One of the problems coming into view was the drastically reducing numbers of priests available to man the parishes, the basic organisational unit within the Roman Catholic Church.

Figure 1 (Oostveen 1986) shows how dramatic the problem is for the Church and her faithfull parishoners.

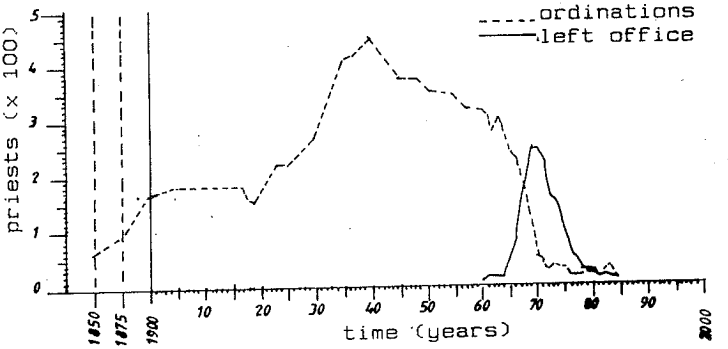

Figure 1: Dramatic decline in ordinations

Figure 2 (Oostveen 1986) shows what this means in terms of absolute numbers of priests available in comparison with the Roman Catholic population. Although this population has been even declining a little recently the relation between numbers of pastors and faithful is well below standard. Whereas in 1965 for instance the roughly 2000 parishes in The Netherlands had 2 priests on the average, at the moment quite a few parishes cannot even have one.

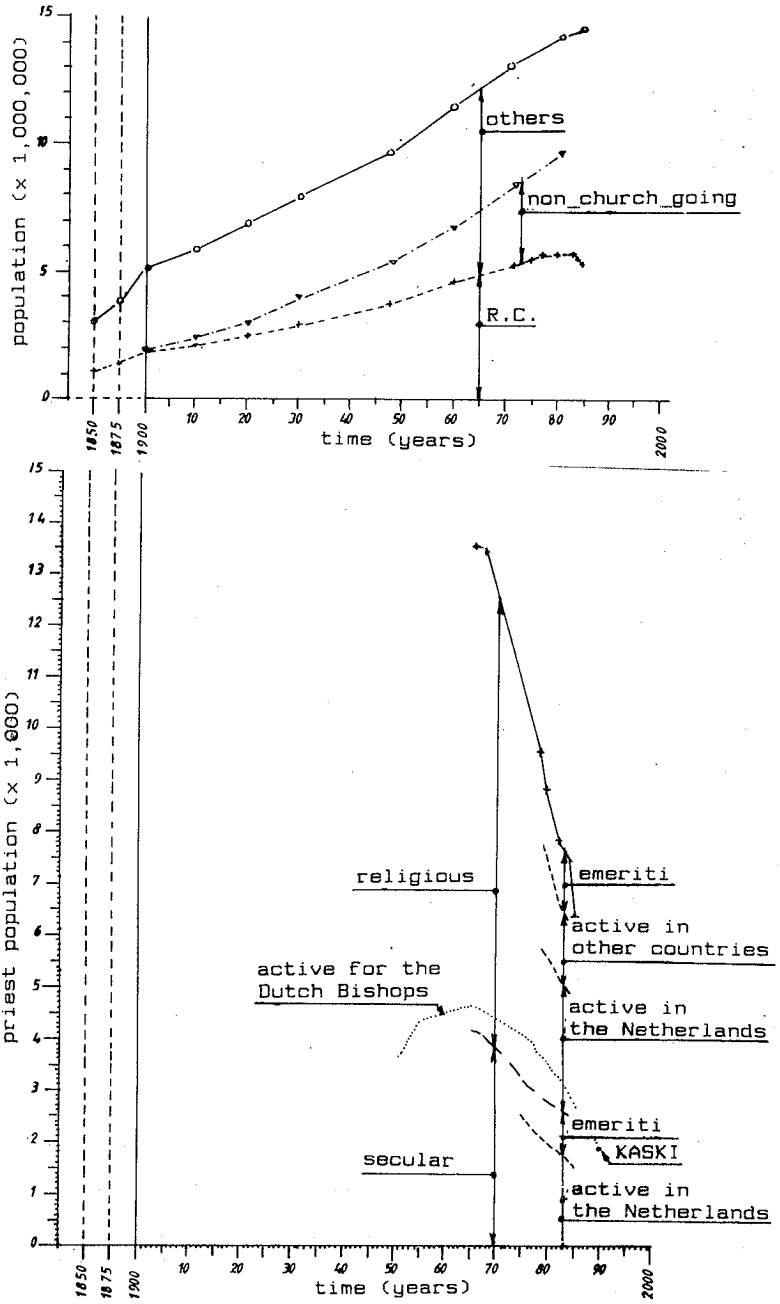

Figure 2: Priest population compared with total R.C. Population

Prognoses by the Catholic Statistics Bureau KASKI (1985) suggest that if the present trend continues in the year 1990 only 1900 priests will be available for parishes against 4092 in 1965.
The main reason is of course the graying priest population, as shown in table 1.

Age group	Numbers 1.1.83 (KASKI 1985)	Percentage
25-34	64	2.1
35-39	140	4.4
40-54	1305	41.4
55 and older	1641	52.1
Total	3150	100.0

Table 1: Age structure priest population

With more than half of the population 55 years or older, unless there is an equivalent recruitment rate, within 10 to 15 years the population will have practically been halved. And recruitment rate is extremely low.

REBELLIAN AGAINST THE SEEMINGLY INEVITIBLE

The Catholics of Holland are however a staunch race. Their history during and since the Reformation proves they will not easily succumb to the seemingly inevitible. Without legal rights after about 1573 and virtually forbidden to have priests they developed systems of importing missionaries from other lands and sending their youth to seminaries abroad so that great numbers succeeded in keeping their faith and traditions alive (Rogier 1945).

A second feature of this rebelliousness is the fact that very often laymen and not clerics took a major part in bringing about change. A famous example was the fight for Catholic emancipation during the first half of the 19th century. Some of the more important newspapers were initiated by Catholic laymen (Nieuwe Rotterdamse Courant, Handelsblad, De Tijd) and singular was the memorandum of J.A. Alberdingk Thym in 1852, bye-passing all official (clerical and Government) channels convicing Pope Pius IX to reinstate the dioceses of Utrecht and Haarlem on the grounds that tradition demanded it as Utrecht was the bishop's chair of Willibrordus in the 8th century.

So the question posed by the Roman Catholic (lay) client was: what is to be dame about this decline. What are the possibilities for growth anew?

In fact, leaving aside the religious convictions involved, this is just the reaction of the businessman who sees his business going down. He is convinced his product is good and asks himself where have I been slipping-up in management. He calls in his advisors and tries to analyse the situation before taking decisions based on facts but also on his strong intuition and especially, convictions.
The question asked of the modelling effort can be represented by figure 3.

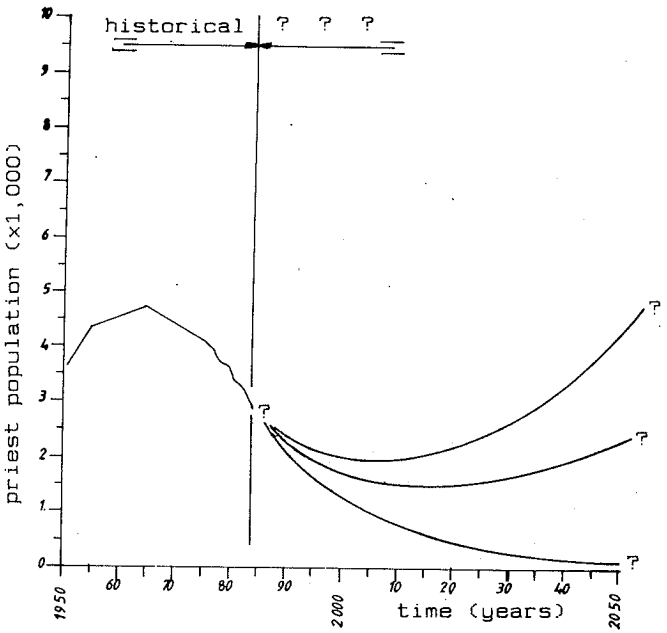

Figure 3: How will the priest population develope?

As this is basicly a demographic system with management policy interactions the System Dynamics Method (Forrester 1963, Pugh 1982) seemed a very suitable quantifying and presentational approach.

BASIC ARGUMENT OF THE MODEL

Figure 4 shows the basic hypothesis underlaying the behaviour of the system. As is clear from the above it is based on strong convictions, rooted in historical experience.

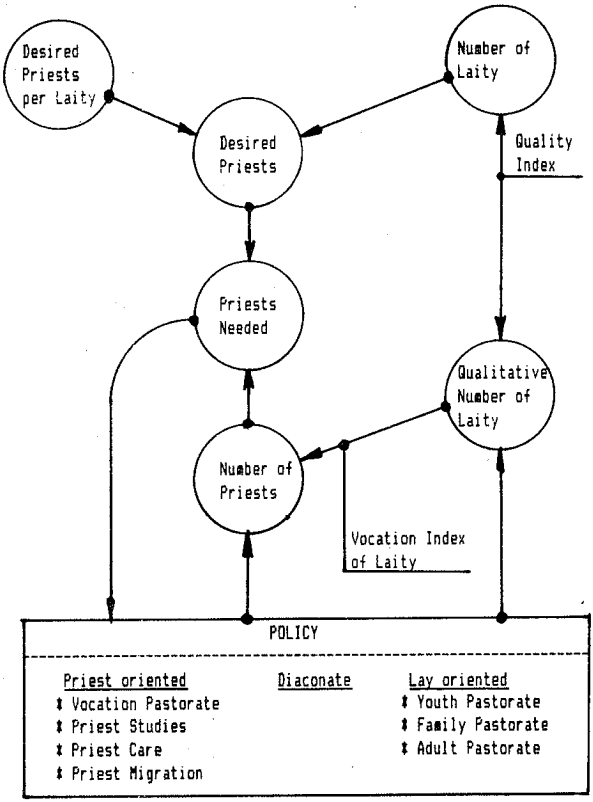

Figure 4: Basic argument of the priest population behavioural model

BASIC MODEL STRUCTURE ARTICULATED

The model includes three demographical streams: priests, lay catholics and non-catholics. See figure 5.

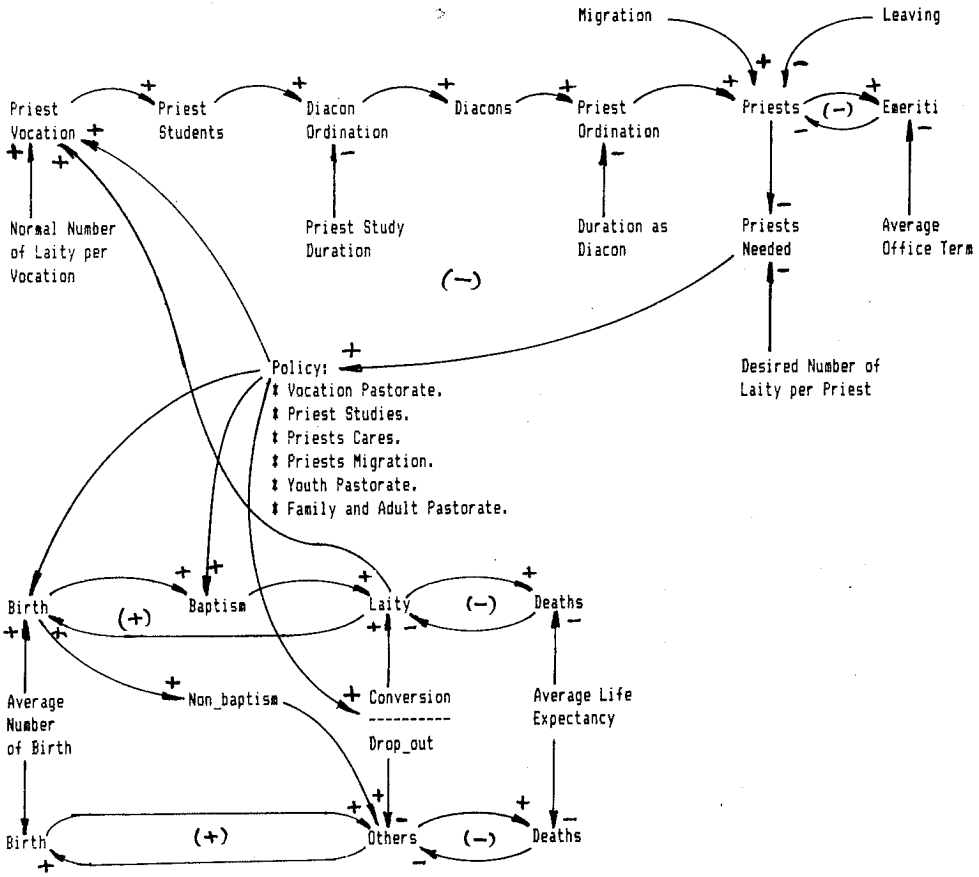

Figure 5: Priest population influence diagram

The priest "stream" begins with vocations to the priesthood, continues through an average of 5 years philosophical and theological studies and spiritual and pastoral formation followed by ordination first as deacons followed after about one year by ordination as priest at about the age of 25 years. Priests continue for life, though they become pensioned (emiritus) from fulltime pastoral activities usually at the age of 65 to 70 years.

The lay Catholic "stream" starts at birth, or rather baptism into the Church, and continues normally for life.
The non-catholic "stream" is the difference between total population of the Netherlands and the priest and lay Catholic populations.

Influencing these "physical" conservative systems or streams are various policy factors. Indicated in figure 5 are

1) Vocations pastorate which aims at creating the right conditions for fostering young men to follow the spriritual call to the priesthood. It includes for instance building up the image of the priest as some one with a special, important and (spiritually) rewarding task in life.

2) The quality of preparation of the priests for their task is obviously very important for the growth of many aspects of the Church. One can compare it to the quality of training for executive and management posts in business.

3) It is of course not enough to provide a 'once and for all' education, training and formation. As in other fields of knowledge and work the people involved must be more or less continually kept up-to-date: you could call it 'education permanent'.

4) It is obvious that the young generations have to be well cared for if their knowledge and living of the faith is to grow. Youth pastorate is intended to look to this.

5) The family and adults have their own pastoral needs. Many church programs of pastoral activity are specifically directed towards these groups.

How the 'physical' streams relate to the "policy" factors is more explicitly shown in Figure 6, where the three main streams are further disaggregated into age classes, and more importantly, quality classes.

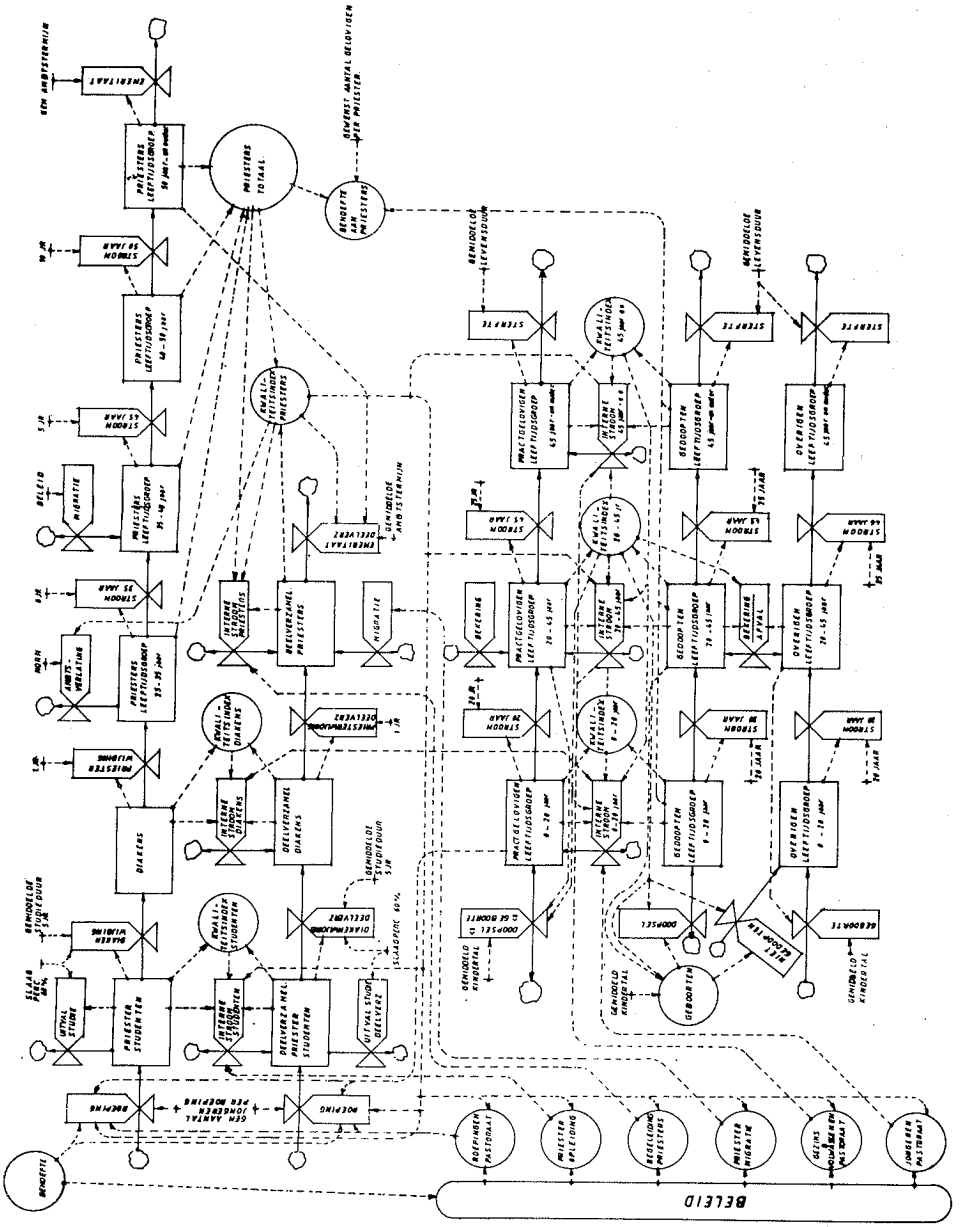

Figure 6: The disaggregated priest population flow diagram

HOW QUANTIFY QUALITY DIFFERENCES?

It was quite obvious that a good deal of the problem of few vocations, recruitment rate and ensueing 'graying' of te priest population was a crisis of identity. For various reasons which we cannot go into here but which are abundantly documented elsewhere (Bots 1982, Van Munster 1982), many lay catholics together with their priests had been losing a sense of mission and were little by little being engulfed in a more and more secular society, which was forgetting the judeo-christian origins of its more fundamental values.
This required the definition of quality indices for both lay and priest populations.
The suitable index of quality for the catholic lay population was found in church attendance rates. The technical report (Oostveen 1986) on this work provides more detail on this point but fig. 7 shows the relevant hostorical trends.

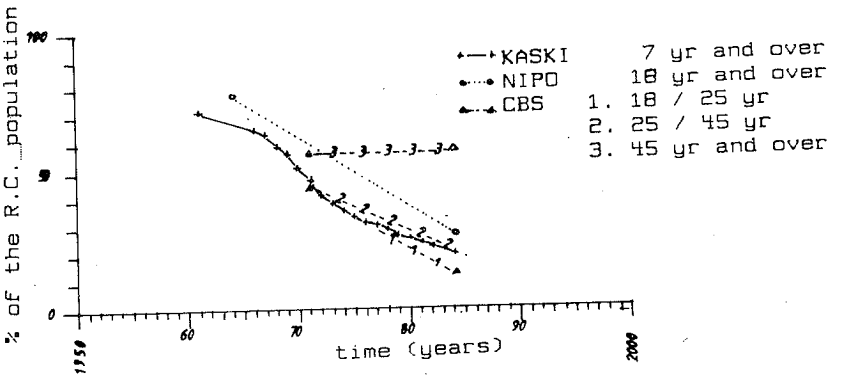

Figure 7: Church attendance per age group, year 1960 through 1985

Based on these trends the lay population age groups were initialised with qualities expressed as percentages of desired quality:

0-20	years	.15
20-45	years	.15
45	years and older	.55

In the case of priests, quantification of quality was much more difficult. One relevant factor however was the number of vocations. From historical sources and expert advice it was possible to determine average incidence of vocations in what one might call a healthy thriving spiritual community that the church ought to be.
Indentification of potential candidates with attractive images of what a priest is and does is by far the greatest influencing factor in promoting vocations. The quality of the priest determines the number of vocations (and also to some extent the quality). A simular mechanism is true in general in all walks of life, so we found this a plausible approach to filling-in an initial quality for the priest population.

It is assumed that on the average every priest during his active lifetime is able to inspire his church members in such a way that at least 3 vocations arise.

This means for a priest population of about 3800 in 1977-78 in 1983-84 about 170 ordinations might be expected. In fact there were only 26, so that the model is initialised with a quality index of 26:170 = 0,15.

MODEL STRUCTURE

Having decided to dissagregate the priest and lay catholic population not only according to age but also according to quality it was necessary to consider the relationship between the formal (total) populations and the equivalent or quality population of practising (i.e. regularly church going) catholics and the 'quality' population of priests(i.e. equivalent number of priests able to inspire potential vocations).

The main features of these relations can be followed in Figure 6.

Thestream of non-catholics

This is determined on the one hand by its size and the stream entering and leaving. It is divided into three age groups: 0-20, 20-45, and 45 and older, the stream form one to the other depending on the duration in each group. The stream entering comes from births, both those from own population and those from children born to catholics but not baptised. The number of births is taken to be the number of women in the 20-45 year group devided by the duration in this group multiplied by the average birthrate somewhat adjusted to llow for the 3% births to women outside this group. The birth rate assumed is 1.5, see Figure 8.
The average death rate is determined by dividing the 45 and older population by the average lifetime of this group which is for the Netherlands the average life expectancy of 78.5 years minus 45 = 33.5 years.

Besides this the population can change through conversion and/or lapsing.

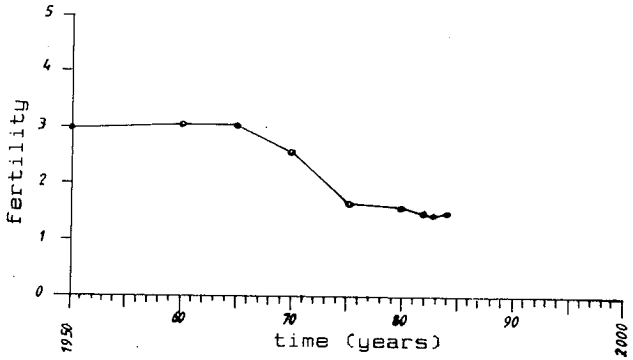

Figure 8: Average number of children to women aged 20-45 yrs., 1950 to 1985

Both the number of not baptised children born to catholics and the result of conversion and lapsing (negative conversion) is highly dependent on the quality index of the catholic population.
This is explained further in relation to the stream of catholics.

The stream of catholics

This stream consists of the formal population of all registered catholics and a subset of the practising catholics. A quality index gives the relationship between the formal and the subset population. As already discussed the index is based on the National Bureau of Statistics figures for church attendance.
The age groups are the same as for non-catholics.
The birth in-stream for the formal population is that given by the normal birthrate less those not baptised.

The number baptised is taken to be influences by the quality index (Figure 9).

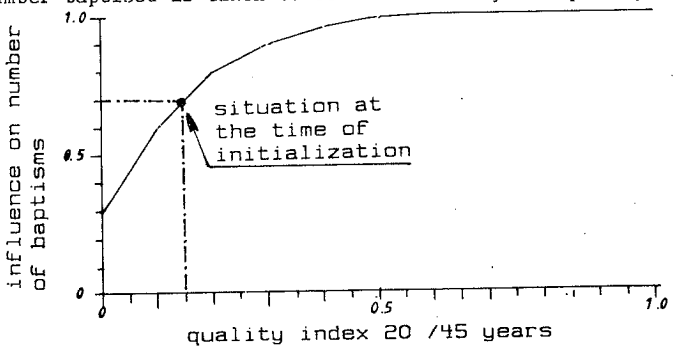

Figure 9: Influence of quality index on baptisms

The birth in-stream for the practising population is determined by the number of baptisms and these are assumed equal in this case to the number of births. Because of religiosity (expressed as church attendance) statistics show that a higher birthrate can be taken for believers (V.d.Giezen 1985). The quality index is again taken to influence this so that a lower index gives a birthrate equal to the rest of the population (Figure 10).The maximum is taken to be that from before 1960 which was roughly 3 (Figure 8).

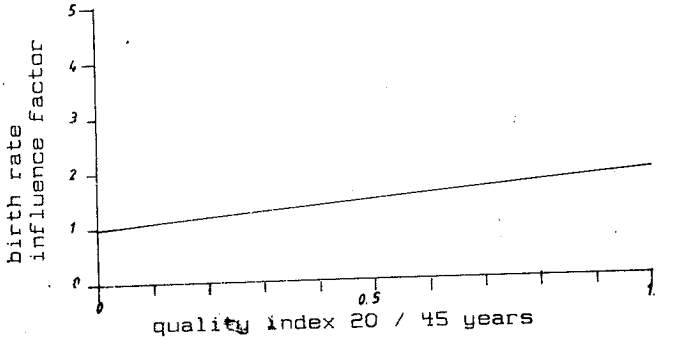

Figure 10: Influence of quality index for 20-45 year age group on birthrate

The connection between the formal and practicing population is dependent on the relevant quality indices and also Church policy programmes such as religious instruction and youth and adult pastoral activities. This connection is seen in the model as in and out stream to and from the practising subset of population. The direction of the stream is dependent on the value of the influencing quality compared with that of the formal population. The value of the stream is a function of the population and a streamfactor. Depending on the quality index value, positive or nagative, a certain percentage streams in the one or other direction. Figure 11 shows the relationship used.

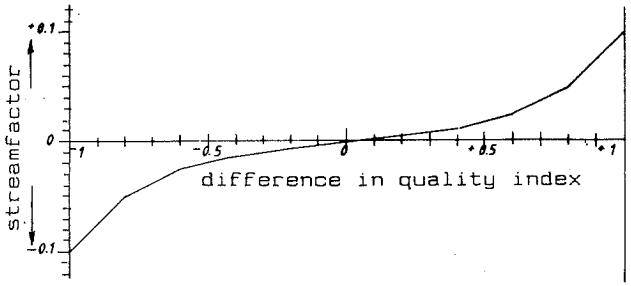

Figure 11: Stream factor between formal and practicing population

This stream factor is used in principle throughout the model. The different interacting variables are attained by weighting this factor.

The main influences considered are:

* Influencing the 0-20 yrs group.
  - Quality of the 20-45 yrs group where the families are formed and the children grow up. The influence is large. A weighting factor of 2 is taken.
  - Quality of the 45 yr and older group. The influence of grandparents and adults on children is evident but less than the home. We take a weighting of 1.
  - Quality of priests. They represent not only the Church, but religion itself. This influence on the young is paramount. Weighting 3.
  - Quality of youth pastorate.Here religious instruction and living are central. Both the quality of the instruction (influenced by priest quality) and instruction policy quality (Hierarchy) are involved. Weight is taken as the average of priest quality and policy factor with its own weight valued at 3. In the zero-alternative (no policy changes) the policy factor is taken as the initial value of the quality index of the priest population.

* Influencing the 20-45 yr. group.
  - Quality of the two other groups. A weight of 1 is taken.
  - Quality of priests. Very important for families and young adults. Weight 2.
  - Quality of family and adult pastoral activities. On these depend contact with means of growing in the community. Weight factor 2.

* Influencing 45 yr and older group.
  - Prosumably influences from the other two groups but not weighty: 1.
  - Quality of priests. Mature adults will be less influenced. Weight 1.

The priest stream

From Figures 5 and 6 and what has already been said the general structure of the priest stream will be clear. Here again the stream is divided into a formal part and a subset indicating quality differences.
Average vocations are determined from the potential number of youths from which vocations can come and an average number of vocations per number of youths. The potential number of youths from which vocations can reasonably be expected is determined by multiplaying the formal number of youths by the relevant quality index.
The average number of youths to a vocation is assumed determined by the product of a norm value and a number of influencing factors thus incorporating sociological and policy influences on vocations in the model.

The more important influences brought into the model in this way are:
- Influence of average number of children. Practice has shown that relatively more vocations came from large families;
- The need for priests will influence the selection criteria;
- Influence of vocation policy programmes.

The levels in the priest stream are also influenced by the rates of failure in studies (40%), the internal rates of change from formal to quality subset and also migration.

The internal change from and to the priests subset of population and formal population is similar to that described in the case of the catholic lay population. It depends on the quality indices. The main influences are:
- the quality of the lay faitful: weight 1;
- the quality of priests (on students): weight 2;
- the quality of education of students: weight 3;
- policy with regards to looking after, and continual education of the priests.

POLICY ALTERNATIVES

The normal policy alternatives have already been named:
- Family and adult pastoral programmes
- Youth pastoral programme
- Vocations programme
- Priest education programme
- Care for priests in service.

Another extra policy alternative is immigration of priests (or priest students) from elsewhere. In fact this has been going on for a number of years now. Dutch missionaries have been repatriated and have been able to fill a gap in the ranks of the priest population. But this possibility is drying up so that further migration would have to come from other countries.

In the model the normal policy alternatives are assumed possible with 80% effectiveness reduced only by the quality index of the priest population as this is also the main instrumental influence in carrying out the various

programmes. The better the priest population the more effective the programmes.
In the case of migration, tests are run with the migration of maximum 25 and maximum 50 priests per year with a delay time of 3 years.

RESULTS

The following alternatives were run and results are summarized in figure 12.

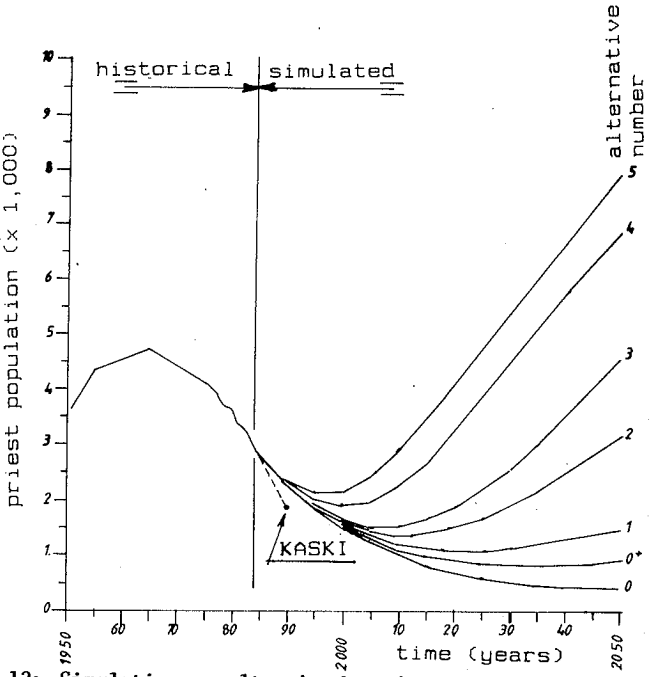

Figure 12: Simulation results showing the priest population in time as a result of various policies

Figure 13 shows that the model total population compares satisfactorily with National Bureau of Statistics (CBS)forecasts in three variants.

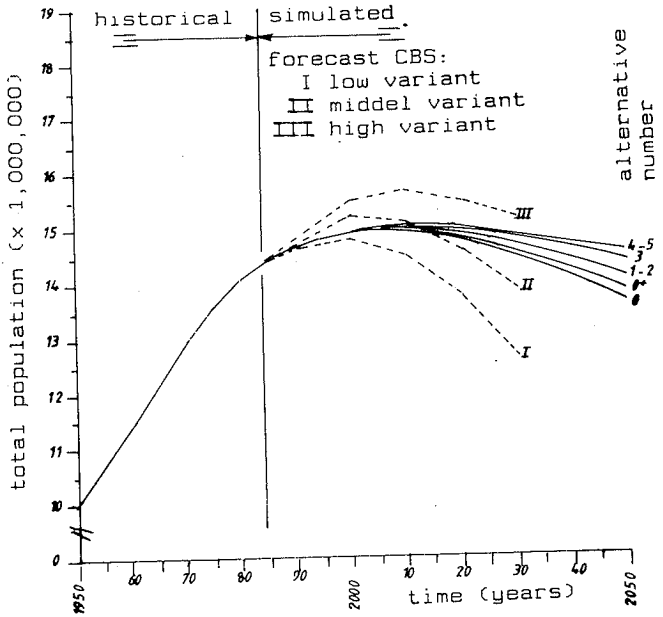

Figure 13: Model total population forecast compared with CBS forecasts

The policies and results are as follows:
Zero-alternative: This is the case when no action is taken. Even this shows a more optimistic result than the KASKI forecast (Hemert 1985 and figure 12).

Zero-plus-alternative: This shows the effect of including an increased fertility rate due to increased church-going rates. Only after ca. 25 years does this begin to make a difference.
This alternative is included in all the following.

Youth, family and adult programmms (alternative 1).
In the end these programmes help in counteracting decline but only on a longterm basis do the results begin to be effective in terms of more priests.

Vocation and priest care programmes (alternatives 2).
These programmes alone double the results in time compared with programmes directed only at the lay people.

Programmes directed at both lay and priest populations (combination of alternatives 1 and 2).
Give even better results in time but it still takes about 50 years to reach even the 1984 level of priest numbers.

Immigration of priests (alternatives 4 and 5).
This together with programmes on all fronts is to only way to really get

things done in a relatively short time. Even then it will take about 25 years to get back to even 1984 standards that are seen as being less than ideal.

CONCLUDING REMARKS

One of the main results of the model was the demonstration (even to the sponsoring body) that the natural time-lag inherent in such a demographic system made it practically impossible to bring about major changes in less than 50 years counting on normal local resources.
Only by making abundant use of external resources through immigration is it probable that the level of population of priests existing at this moment (1986) can be regained. The consequence is inevitable decline if not extinction or strong and bold measures on all fronts, including necessarily abundant immigration of priests from elsewhere.
This last is far from unrealistic as various countries such as Poland can probably supply the right men, and the missionary experience of the Church in The Netherlands is such that the associated inculturization problems need not influence the policy unduely.
Operationalizing the immigration policy and indeed the other policies has not been the subject of this study. As is the case with (missionary) migration the Dutch Catholic church has also very much experience and spiritual heritage in all sorts of pastoral entrepreneurship. This model is simply a sophisticated way of confirming the popular truth "where there's a will, there's a way".

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