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Economic Effects Of Decentralization Of Government With People Empowerment
An International Comparison Of Four Asian And European Rural Localities

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ABSTRACT

Devolution of political-administrative powers to localities and direct democratic people empowerment are thought to create a more conducive environment for local economic development. To investigate this, a policy and planning simulation model was developed. The study compares two decentralizing Asian localities with two politico-administratively decentralized European localities. The lack of hard data on the local level suggested the use of System Dynamics as analysis and simulation methodology. Social Network Analysis was used to develop the systems' power structure. Time simulations of people empowerment policy changes revealed that these matter and that fully empowered villagers are beneficial for the development of a locality.

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1 Introduction

It is generally assumed that central governments do not fully understand and therefore cannot appropriately meet the needs of localities. This stems in part from their remoteness from people's problems and needs. As a consequence, informational and organizational transaction costs increase and this decreases efficiency of the governance and development processes. As transaction costs become smaller the closer the economic agents are to each other, decentralization of powers to the local level can improve governance, economic and development efficiency with beneficial effects on the welfare of local people (Bardhan and Udry, 1999).

The decentralization model furthest developed is a federalist state system organized along the lines of the principle of subsidiarity[1] where governmental tasks remain for economic

[1] on subsidiarity see also Riklin Alois et al., (1994); the term 'subsidiarity' was first used by Pope Pius XI in 1931 to describe the decentralization of power and authority in the Roman Catholic Church, through the institution of the episcopate (from Scruton, Roger, A Dictionary of Political Thought, Macmillan, London, 1996)

efficiency reasons with that level of government where the tasks have to actually be performed and, where the services are actually consumed and ideally paid for (Jaber, 1994).

Rueland and Ladavalya (1993) showed that a prerequisite for successful decentralization of political and administrative systems are strong local institutions such as traditions, norms, laws, and organizations with intensive and influential vertical and horizontal linkages that act as conveyors of needs, as pressure instances, and as constraining and checking instances on administrators and politicians (Iddagoda and Dale, 1997). It is also believed that for decentralization, and particularly for granting direct democratic powers to the local people to work, a certain minimum standard of material, educational and organizational development and political maturity must be present (Rondinelli, 1986).

As top down rule, low institutional and organizational intensity, dependency relations and crony politics, low educational and material standard are believed to be present particularly in developing countries, a comparison of developing and industrialized countries for the analysis of the impact of decentralized government with direct democratic powers of the villagers was undertaken. The question of how different localities in different cultures and on differing developmental levels organize the politico-administrative powers, and whether devolvement of political powers to the people in a direct democratic fashion can contribute to the improvement of welfare and development, and whether this allows the poorer countries' localities to economically and developmentally close up to the richer countries' localities is the focus of this study.

2 The Choice of the Localities and Research Framework

A federalist system, representing the most devolved political system, is chosen as benchmark system for the comparison with the other systems. Frey (1999) writes "…participation rights…while they exist in many countries, its regular use is concentrated in just two countries: in the United States on the sub-federal level…, and in Switzerland on all three levels of government (nation, canton, commune)." The extreme and long-lasting decentralization status with full people empowerment of Switzerland makes it an ideal yardstick country against which other systems can be compared. The three other countries in this study are:

- Thailand, included because of her traditionally very centralized politico-administrative system, and because of Thailand's political agenda for decentralization.

- Spain was included, because of her powerful and successful decentralization drive during the past 25 years, in addition to being a Constitutional Monarchy like Thailand.

- The Philippines having been a Spanish colony for over four hundred years is an interesting candidate for a comparison with Spain. In addition, her traditional strong regionalization makes the Philippines an interesting case for a comparison with the two culturally strongly regionalized countries Switzerland and Spain.

For the analysis of the effects of decentralization of government on local growth and income, politico-economic simulation models were constructed that allow the simulation of the devolution of political powers to the villagers versus the exclusive or partial concentration of these powers in the hands of the local government. The study does not deal with the power and choice relations between local and upper government. When the talk is of decentralization or devolution of government, it is understood to ultimately mean granting direct democratic powers to the villagers themselves, with the local government being the executioners of the peoples' will only. The models do not include the social and distributive effects of local government policies, and are therefore partial models of the local politico-economic process. The models also ignore natural limits to local growth and international and national macro economic growth enhancements or limitations, they incorporate real values only, as the national monetary economy is excluded.

To complement the available data necessary for the construction of the locality models, two different field surveys were conducted in each of the four localities:

- one with a sample of the villagers on the 90% confidence level and
- one with the complete local government council

Specific questionnaires for each group were administered. Besides questions with regard to perceptions and opinions, a major part of the questionnaires was devoted to the investigation of power relations that were analyzed with the tools of Social Network Analysis. Original English questionnaires were translated into Thai, German and Spanish. The English version was used in the Philippines. The questions were identical for all localities and authorities.

In each country a poor rural locality on the lowest governmental level that enjoys some legislative and taxing power was chosen. They are in Thailand Sukhapiban (now Tessaban Tambon) Huay Yai in Cholburi Province some 150 km southeast of Bangkok, in the Pihlippines Barangay Labac in Cavite Province some 50 km from Manila, in Switzerland Bezirk Schwende in the Canton of Appenzell Inner-Rhoden, and in Spain the Municipality of Zorita in the Province of Caceres. All four localities are agriculturally based and in relation to their country's average income poor.

3 The Dynamic Models of the Sample Localities

All models are based on respective theories and local laws with empirically derived parameters and behavioral functions from the field survey data. The fundamental assumption of the models is that there is an economic base growth rate for all localities in a given country that is determined by the national endowments with natural resources, know-how, human capital, national institutional framework and national policies. The differences in regional or local growth and development are based on unequal endowments of the localities with these resources. It is these differences that hamper local development or provide opportunities for local development and growth, and that create developmental and growth differences among localities. In the models, local policies and parameters are added on top of national values. The link between local policies and national policies is the average national economic growth rate to which the local policies and values are added to produce local growth and development that may be higher or lower than the national average.

The locality template model consists of the following six modules:

- Empowerment Module
- Financing Module
- Planning Module
- Expenditure Module
- Income and Growth Module
- Development Transmission Module

The full systems are detailed representations of the villages' politico-economic structure and processes. The models consist of the following elements:

143 equations, 79 auxiliaries, 40 constants, 14 lookup functions, 5 levels and 5 initials

The local politico-economic process starts at the empowerment module of Figure 1 and ends at the development transmission module, which feeds again into the empowerment module to start a new process.

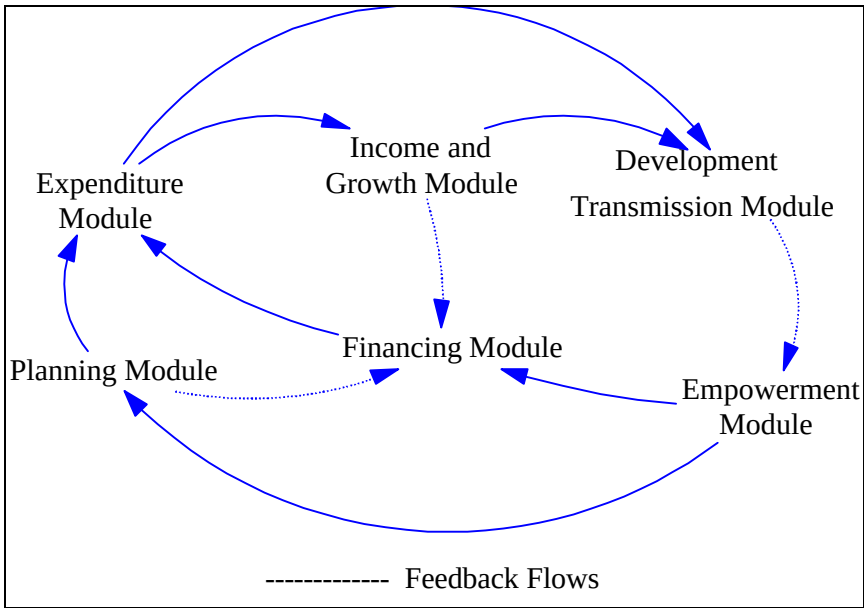


Figure 1: Dynamic Process Of the Template Politico-Economic Model

Based on the field survey results a correlation analysis between factors assumed to be at the core of the political and economic process revealed the following significant influence pairs:

- development status change, Organizational Intensity, Academic Attainment and
- "undertaken something against unfulfilling councilors", "questioned a councilor", "number of proposals made", "influence on the local budget"

The correlation analysis served to substantiate and support the cause effect assumptions determined through the study of the local politico-economic process in the filed.

The field survey results suggest that villagers' perception of an inadequate developmental improvement ignites the political process. This process ignition is supported by the classical motivational theory of Abraham Maslow (1943) that says that a felt deprivation or unfulfilled need motivates behavior. The survey results also revealed that villagers expect the development status to improve at the national economic growth rate, and the more the

actual development change is at variance with expectations, the more this motivates them to engage in political activity seeking corrective measures from the local government. An OLS Regression analysis also revealed that organizational intensity and academic attainment reinforce the activity ignited by developmental deprivation.

The force going out of the Empowerment Module (Figure 2) is "Development Frustration", which depends on "Development Status" and on its change, and on "Organizational Intensity". If the growth expectations are not met, villagers are disappointed with the performance of their village's economy and with the performance of their local government. This disappointment is called "development frustration". "Development frustration" is therefore defined as the discrepancy ratio between actual and expected "Development Status", amplified by "Organizational Intensity".

Development frustration is fed as political pressure into "Villagers' Finance Pressure" and "Villagers' Project Pressure". Depending on the empowerment status of the villagers, these pressures will be exerted on the local government or not. The empwerment status is expressed in the parameters "Villagers' public finance bargaining power" and "Villagers' project bargaining power" that are designed as political parametric switches. If the villagers are given the legal right of referendum, in either one or both empowerment dimensions, the switches are given the value 1, and thus villagers' project and, or finance pressures are activated. If the villagers do not enjoy these rights, the parameters are given a value of 0, which prevents the powers to become active.

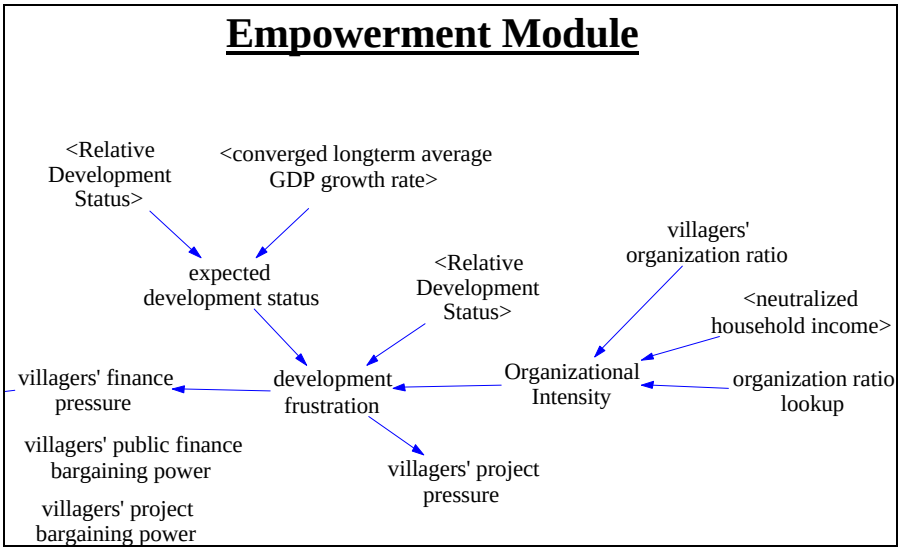


Figure 2: Empowerment Module

Organizational Intensity, which reinforces Development Frustration, is defined as the average organization memberships per villager. According to the field research results, the organization memberships change with changing household incomes. For each locality, organizational intensity lookup functions were developed based on regression analyses using field survey results of organization memberships per person and household income. In the following the derivation of "Organizational Intensity" of the Zorita model is presented. Organization memberships in Zorita first increase directly with household income, then from a middle-income decrease slightly to increase again from an above average income onwards. Figure 3 shows the average number of organization memberships of respondents who said to be members of organizations or political parties.

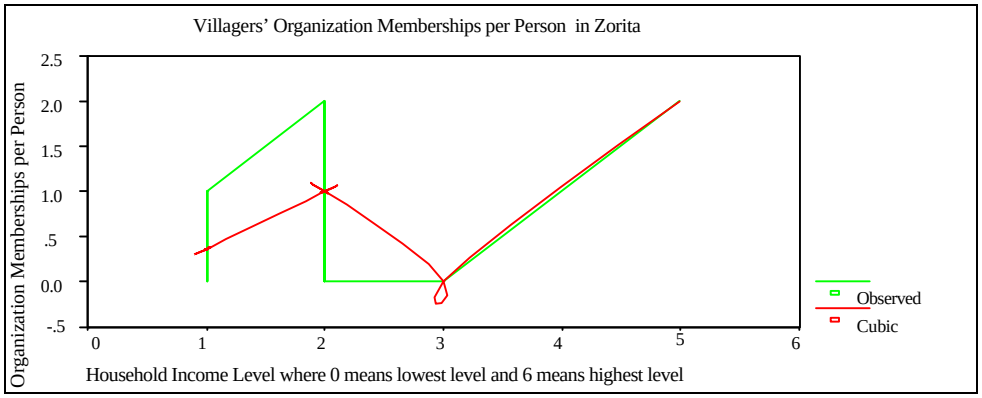
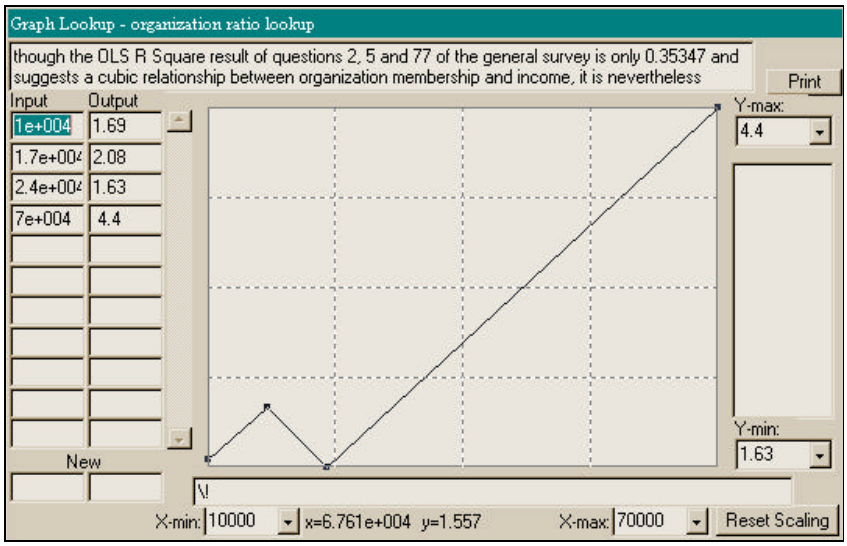


Figure 3: Zorita Regression Graph of Organization Memberships as Function of Income

Figure 4 shows the translation of the empirical graph of Figure 3 into the lookup function "organizational intensity lookup". The horizontal axis shows annual household income in US$, the vertical axis the organization multiplication factor that produces "Organizational Intensity".



the horizontal x-axis shows household income; the vertical y-axis shows the multiplication factor

Figure 4: Organization Ratio Lookup for Zorita

The lookup function drives the parameter "villagers' organization ratio". The constant "villagers' organization ratio", indicates how many percent of the villagers are organized e.g. in Zorita 56.6% of the respondents in the general public survey indicated to be member of a political party (13.3%) or of an organization (43.3%), and thus villagers' organization ratio is 0.566. This value is multiplied with the output of the lookup function to produce "Organizational Intensity" (see Equation 1 in the Appendix) representing average organization memberships per person (Figure 2).

After Organizational Intensity is calculated and fed into the variable development frustration, the value of development frustration is fed into the variables "villagers' finance pressure" and "villagers' project pressure". If the switches "villagers' public finance bargaining power" and "villagers' project bargaining power" are given the value 1, villagers' pressures are activated; the finance pressure is fed into the variable "adjusted

local tax, charges and levy rate" of the financing module; the project pressure is fed into the budget allocation variables of the planning module.

The planning module consists of two sub-modules:

- Administration Expenditures Plan (Figure 5) and
- Project Bargaining and Planning Sub-Module (Figure 6).

The laws of all the sample localities state that the local governments must strive for self-support, thus administration expenditures will have to be covered from locally raised government income first, before other expenditure categories are planned and financed. Field survey results suggest that the villagers do not want the local government's administration expenditures to rise above the long-term administration budget allocation to which they got accustomed, and that with increasing tax rates they want the local government to first save in administration expenditures before tax rates are raised. This demand is activated only if the villagers enjoy “public finance bargaining power”.

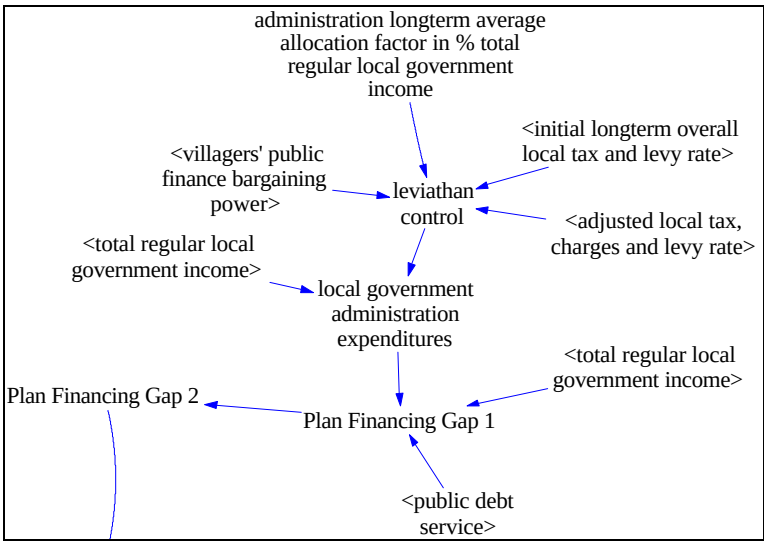


Figure 5: Administration Expenditure Plan Sub-Module

The variable “local government administration expenditures” is constrained by the conditional “leviathan control” (Appendix: Equation 2). This equation is called “leviathan control” because it forces administration expenditures that are a consequence of the government behaving like Brennan and Buchanan’s leviathan (Brennan and Buchanan, 1980) down if the local government intends to increase taxes due to a budget deficit. It thus controls the budget deficit that feeds back into the financing module (Figure 9) where it serves to establish the local tax rates.

The “leviathan control” feeds into the variable “local government administration expenditures” where the actual administration expenditures are generated. The local government’s plan financing gap develops as difference between total regular local government income and total administration, planned education, welfare and infrastructure expenditures as shown in Figure 5 and 6. With each new expenditure or plan category a progressing financing gap is calculated. “Financing gap 4” indicates the planned budget shortfall or surplus. Local government tries to cover this gap through borrowing on the capital market, from upper government contributions, or through irregular financing practices (Figure 9).

If the villagers are project empowered, they may demand programs and projects from the local government. Each part of the Planning Sub-Module (Figure 6) contains two alternative processes, one with project empowered villagers that activates a project bargaining process, and a second one with non project empowered villagers where the village councilors collude to plan a budget that favors infrastructure projects at the expense of welfare and education projects, a fact that was revealed by the survey results.

In the planning modules the powers of all participating actors in the bargaining process come into play. The local government council can be described as a social subsystem within the locality consisting of several cliques. The constituting factor for this sub-system of cliques is the intensity of relations among the local government councilors, defined according to Burt's (1998) Maximum Strength Relation that measures proximity of actors according to their highest number of contacts they entertain to one-another per year. These contacts are believed to rest on common interests. Through a Social Network Analysis, one can identify four cohesive cliques in the Zorita Municipal Council.

The answers of the councilors to the survey questions with regard to the village's most pressing and people mobilizing needs served as basis for assigning them to one of two groups. When in the councilors' answers social concerns prevailed, they were assigned to the "village council welfare group", and when infrastructure and building concerns prevailed they were assigned to the "village council infrastructure group". It was then checked whether these preference groups were more or less congruent with the cliques identified through the social network analysis, a fact that could be confirmed. The welfare group and infrastructure group follow in Zorita the political party divide, with the socialists forming the welfare group and the opposition the infrastructure group.

A next question to be answered was how powerful each councillor within the village council is, and then how big the relative power of the identified cliques is. These relative clique powers were entered in the models as budget allocation bargaining powers. It is assumed that personal power in the localities develops according to Burt's (1998) Power model. Burt (1998, p. 190) defines: "Power comes ... from exclusive relations with powerful players... (not from; added PG) exclusive relations with weak players." Network power is therefore defined as the exclusive relative connectedness of an actor i that is reciprocated from powerful other actors j. To establish a power ranking, the power factor of each person in the network is divided in the power of the most powerful actor. The most powerful actor is the person with the highest relative power score.

Table 2: Power Analysis of the Leaders of the Zorita Municipality

Welfare Group		Infrastructure Group		Upper Government or Non-Voting Officials	
Name	Power Factor	Name	Power Factor	Name	Power Factor
Francisco	1.0000	Diego	.1861	Isidoro	.5092
Tomasa	.6016	Juan Francisco	.0417	Pilar	.0676
Juan Carlos	.6129	Manuela	.0667		
Herminia	.4974	Maria Isabel	.1050		
Juan Jose	.3532	Total Power	0.3995		
Maribel	.1852				
Manuel	.1653				
Total Power	3.4156				

Table 2 shows the relative power of each councilor as percent of the the actor with the highest power factor that is in the Zorita Municipal Council Francisco, the Alcalde

(Mayor). The next powerful persons, Juan Carlos, Tomasa, Herminia are all members of the Socialist Party. The fourth most powerful person is Isidoro the Municipal Secretary who has no voting right in the Municipal Council. All the other persons appear to have only minor power within this network. The sum of the power factors of the welfare and infrastructure group is 3.8151, the power sum of the infrastructure group is 0.3995 and their relative power is 0.3995/3.8151 = 0.105. The total power of the welfare group is 3.4156 and their relative power is 0.895.

Each group's relative power reinforces the demanded budget allocation factor it supports. According to the field research results, the infrastructure group favors infrastructure expenditures and if possible would like to avoid all other expenditures. It is therefore assumed that the infrastructure group supports as a maximum the long-term average allocation factor for education as this allocation factor was decided by the whole Municipal Council and thus was accepted by all councilors. If however education plan demands exceed the long-term budget allocation, the infrastructure group exerts pressure to reduce the demands by this excess.

The welfare group on the other hand is in favor of education, culture and welfare programs. It is thus assumed that the welfare group always wants higher education expenditures and thus supports the demands of the villagers for higher education expenditures, but does not support villagers demands for smaller education expenditures. The welfare group's power is added to the villagers' project pressure and multiplied with villagers' "development adjusted education needs". The education allocation demands of project-empowered villagers are calculated according to Equation 3.

The process at the top of Figure 6 shows the education and culture project bargaining process. Equation 6 (in the Appendix) drives this process. As the participation of the villagers depends on whether they are given project power or not, a conditional "IF THEN ELSE" functional form is used. The condition of Equation 6 says if villagers have no project bargaining power, i.e. the respective switch is set to 0, then the education long-term allocation factor is applied and multiplied with total regular local government income.

The analysis of councilor preferences showed that the welfare group among the councilors favors more education spending. The above outcome is therefore reinforced by multiplication with the welfare group's relative power, to produce the Municipal Council Education Plan Decision that is the share of education in the total local government budget in US$. The long-term average allocation factors of the three plan expenditure categories are the shares of each budget position as percentage of the total local government budget.

If in the power switch "villagers' project bargaining power" is set to 1, the bargaining process within the local government council and villagers' planning influence are activated. If the bargaining process is activated (part three of Equation 6), the Education Plan Decision outcome depends, as in the non-empowered process, first on the total regular local government income, but now villagers make a trade off between higher plan expenditures and lower taxes. The variable "project empowered education allocation factor" that is the allocation factor established through the bargaining process of the village council and the villagers, is reduced by the (plan) adjusted tax rate. This is a feedback control of the villagers that prevents exorbitant plan demands.

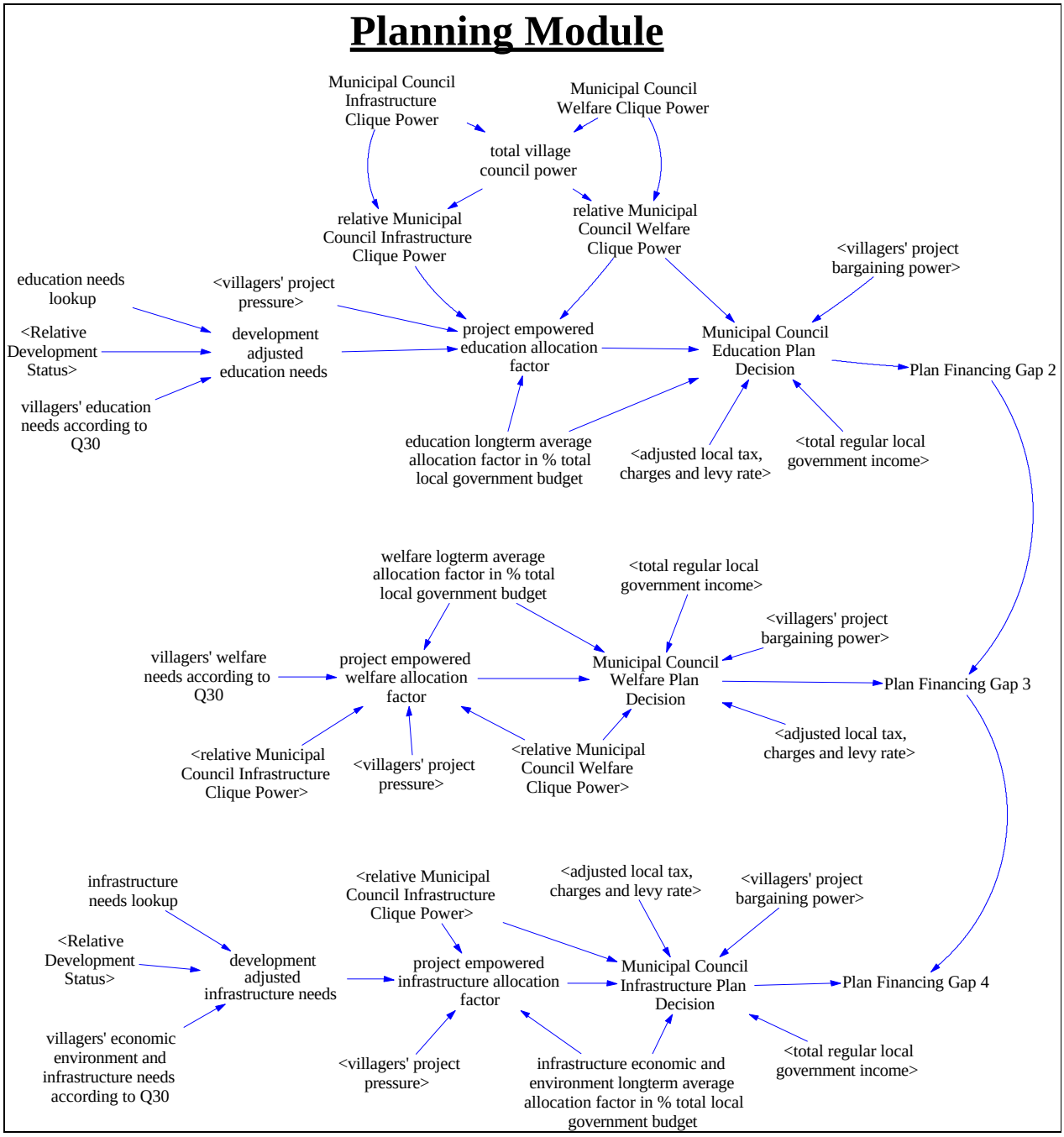


Figure 6: Project Bargaining and Planning Sub-Module

One of the major influence forces on the local political process are villagers' needs. In the questionnaire survey the villagers were therefore asked to list their village's three most important needs. Needs were then classified into education/culture, welfare/public health and infrastructure needs. All the needs mentioned were counted and divided into these three categories. The subtotals of the number of needs mentioned by villagers in each of the three categories were calculated as percent of the total number of needs mentioned. It is assumed that the villagers want the local budget to be allocated to projects according to this needs structure. Villagers' needs demands are activated by their project bargaining power and are reinforced by their project pressure. The education and infrastructure needs are

assumed to change with development status. This change is driven by respective needs lookup functions, that are driven by “Relative Development Status” (Equation 4).

In Zorita 16.3% of all the needs cited by the villagers were education related, and thus the constant “villagers' education needs according to Q30” is 0.163, which means that villagers would like 16.3% of the budget allocated to education. The public “education needs lookup” function is shaped as shown in Figure 7. The function is based on a regression of children's education level as function of household income. Children’s education level is taken as proxy for the changing education needs of the villagers as their household income changes. The regression analysis between children's education level and household income suggests a cubic relationship. Household income is a part of development status. It is therefore assumed that education needs increase with increasing development status, because a higher development status requires higher education to cope with more complex technology. The lookup function departs from the average education status of the village, as measured by the survey questionnaire metrics that ranges from 1 for primary school to 6 for post graduate degree. At the time of the research the average education level in Zorita was 2.73 (level 2 = lower secondary school, level 3 = finished upper secondary school). For the Zorita model the lookup output that produces the education needs ranges from 1 to 2.19 (i.e. 6/2.73 = 2.19). It is assumed that villagers believe that with 2.19 times higher public education expenditures the highest education level could be reached. The lookup functions are however designed that the highest level will never be reached. The lookup x-axis measures “Relative Development Status”, the y-axis shows the multiplication factor that changes villagers education needs.

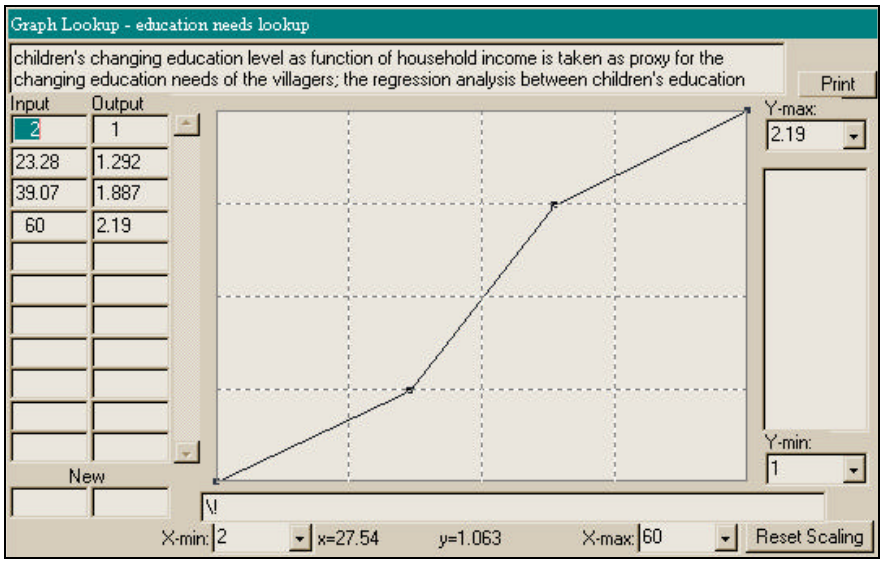


Figure 7: Graph for “education needs lookup” for Zorita

Contrary to the education needs, which vary with relative development status, welfare needs are thought to be constant, i.e. welfare needs are assumed to represent the local villagers' dependency culture on governmental support. As culture based behavior changes only very slowly the factor is assumed to remain constant. The village council bargaining behavior is the same as in the education function. No conditional form was needed for this equation, as villagers of all four localities invariably demand higher welfare expenditures than their local governments are willing to allow.

The welfare plan decision feeds into the "Plan Financing Gap 3" of Figure 6 that should finance the infrastructure plan. The infrastructure planning process is the same as the education planning process, however with support roles now changed and the infrastructure needs lookup the inverse of the education needs lookup. The "Infrastructure needs Lookup" function is driven by the variable "Relative Development Status". At a high development status most infrastructure needs are satisfied, it is therefore assumed that with increased development status infrastructure needs decrease to the initial education needs; thus as education needs increase by a factor of 2.19 to reach the maximum education status, the multiplication factor of infrastructure needs decreases from a value of 1 to a value of 0.45 (i.e. 1 / 2.19 = 0.45). Figure 8 displays the lookup function.

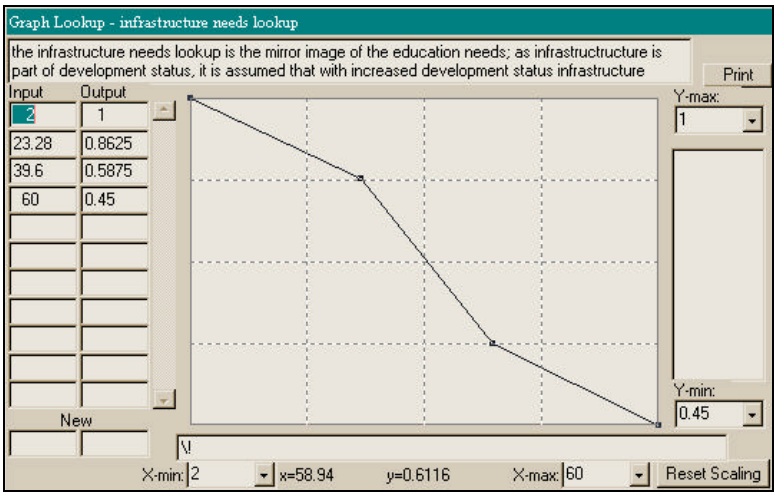


Figure 8: Graph for infrastructure needs lookup for Zorita

The research results showed that the village councils as a whole are always in favor of higher infrastructure expenditures, probably because these offer rent-seeking opportunities. Therefore, when villagers want smaller infrastructure expenditures, the welfare group is thought to refrain from giving support to the villagers, but the infrastructure group insists on their infrastructure demands (part two of the right hand side expression of Equation 5 in the Appendix). But when the villagers want more infrastructure than the long-term allocation factor, they are supported by the infrastructure clique (part three of the right hand side expression of Equation 5).

When villagers are not project empowered, the infrastructure clique pushes for a higher infrastructure budget (part two of the right hand expression of Equation 6). If villagers are project empowered, they again apply a trade off between taxes and infrastructure budget (part three of the right hand expression).

The financing process of Figure 9 starts at the lower right hand side with the "total plan-financing gap". This gap is the shortfall of locally raised tax income for the financing of all plan decisions, and thus shows to what extent the local government would be in a position to self-finance their plans. All the localities, with the exception of Schwende, have declared a process of decentralization. Thus upper governments shift duties to lower governmental levels, and with this, lower governmental levels face a strong pressure to increase their local tax rates.

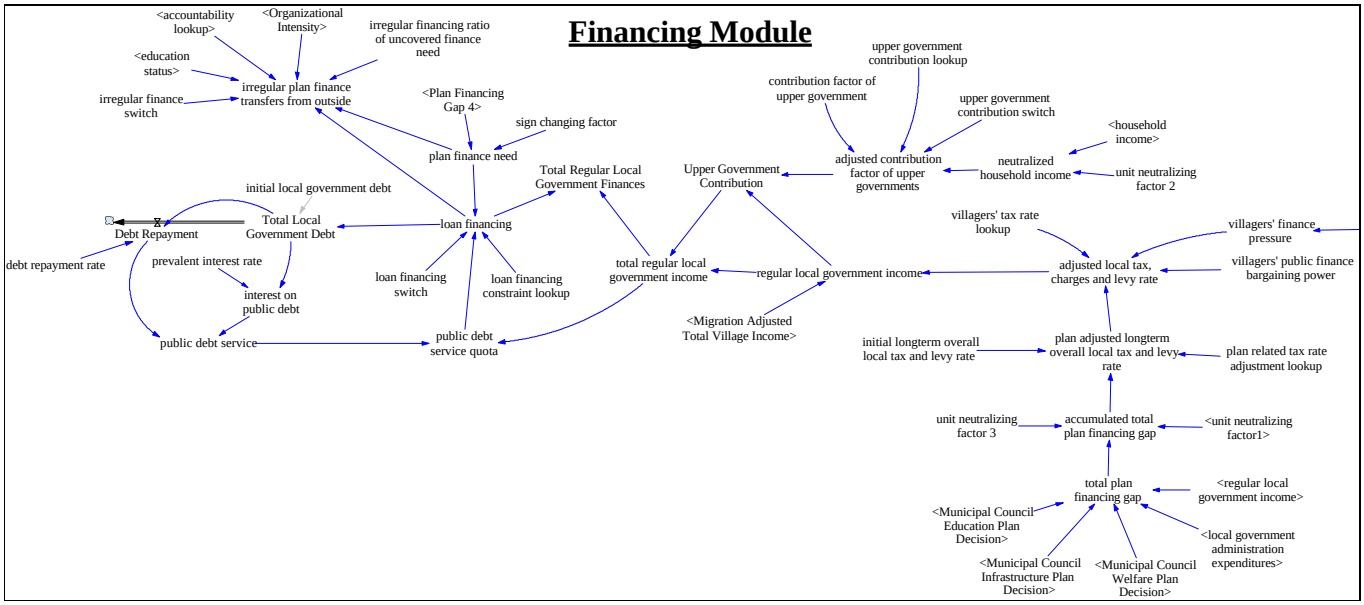


Figure 9: The Regular Local Government Financing Process

It is assumed for all localities that local governments try to increase the local tax and levy rate up to a maximum of 12%, which is twice the initial tax rate of Huay Yai, the locality with the highest initial tax rate. This uniform maximum local tax rate serves to have an equal basis for the comparison of the performance of the four locality systems.

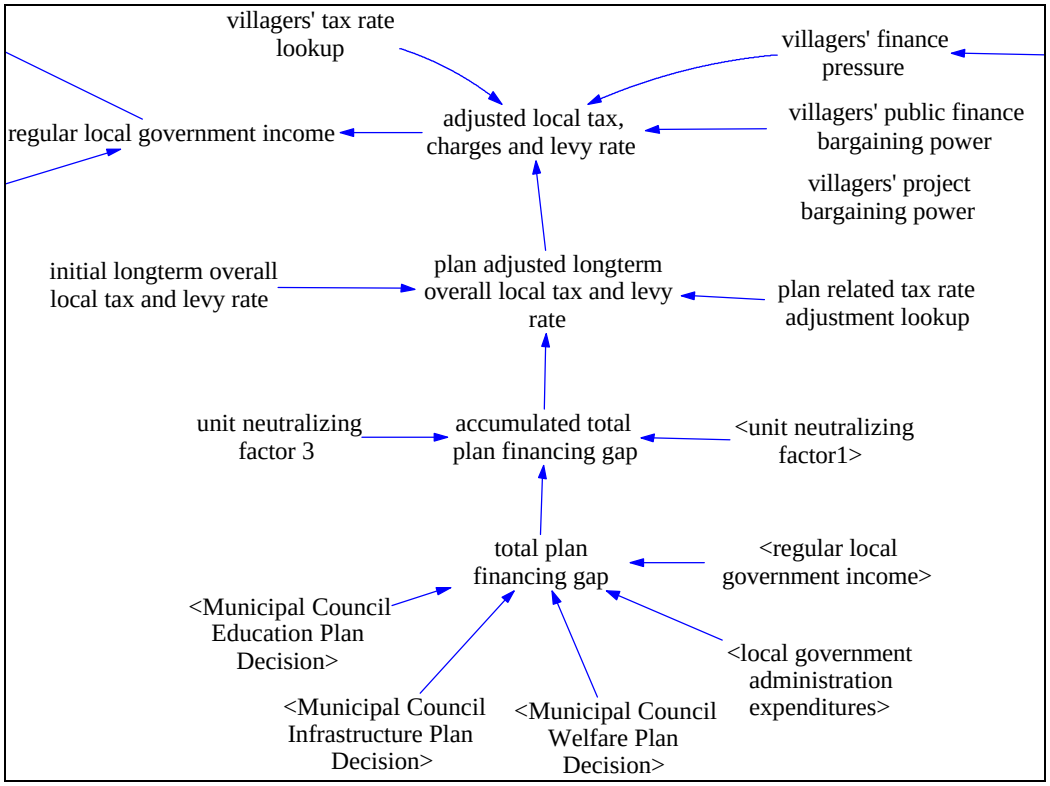


Figure 10: Financing Sub-Module for “adjusted local tax charges and levy rate”

The “accumulated total plan-financing gap” (Figure 10) drives the “plan related tax rate adjustment lookup” that drives the “initial long-term overall local tax and levy rate” to

result in the variable “plan adjusted long-term overall local tax and levy rate”. The lookup function is a linearly rising function scaling up the initial local tax rate.

The variable “plan adjusted long-term overall local tax and levy rate” feeds into "adjusted local tax, charges and levy rate". Here the tax and levy rates of the previous process are either introduced or when villagers are public finance empowered, i.e. the switch “villagers' public finance bargaining power” is set to 1, they bargain tax rates down. It is assumed that public finance empowered villagers try to push tax rates down by 50% when their finance pressure increases, i.e. when their development frustration increases, as they believe the value received from their taxes is inappropriately low, as supported by the field survey results.

In addition to locally raised income, all local governments depend to a varying degree on upper government contributions. In the course of decentralization it is assumed that upper governments of all four localities intend to decrease their contributions to no more than 15% of regular local government income when local household incomes increase, which increase the ability for a self-financed local government. The upper government finance contribution process, shown in Figure 11, is driven by the “upper government contribution lookup”, which itself is driven by household income.

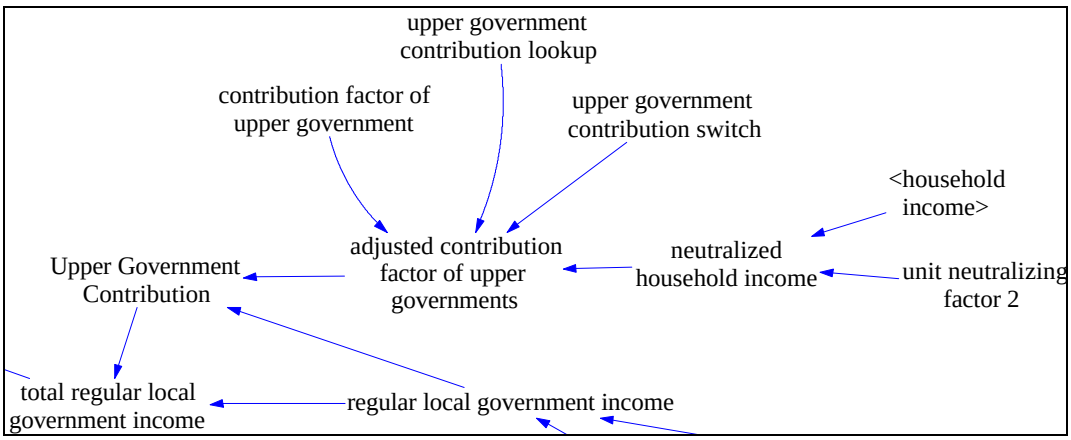


Figure 11: Financing Sub-Module for “Upper Government Contribution”

The output of the “upper government contribution lookup” drives down the “contribution factor of upper government” when household income increases. The sum of locally raised government income and upper government contributions form “total regular local government income”. When this income is insufficient to cover all plans, and laws and statutes allow, local governments can seek debt financing on the capital market. Total regular local government income plus loans make up “Total Regular Local Government Finances” (Figure 12).

Loan financing is fed by “plan finance need” which itself is fed by “Plan Financing Gap 4”. As the plan financing gap is a negative figure if there is a budget deficit, it has to be made positive by multiplication with the sign changing factor to indicate a positive finance need; if the plan finance need remains negative after multiplication with the sign changing factor, a finance surplus is indicated and therefore there is no need for additional finance. Loan financing is allowed when the loan financing switch is set to 1, debt financing is not allowed, if it is set to 0. The loan financing constraint lookup limits public debts by setting an upper limit to debt service as percent of total regular local government income. It is

assumed that the public debt service in all localities may not exceed 10% of total regular local government income.

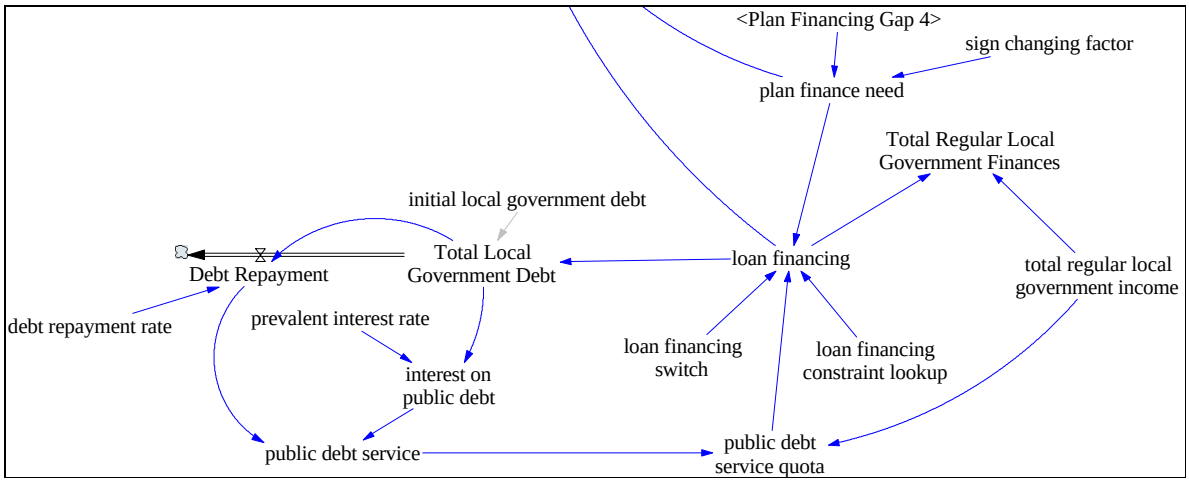


Figure 12: Financing Sub-Module for "loan financing"

The field survey revealed that when total regular local government finances are not sufficient to cover all plans, and in this instance particularly infrastructure plans, the two Asian local governments seek irregular financing through back door channels to upper government or to other unofficial finance sources. These finances are often granted against election promises or against promises for rent seeking practices. The irregular financing process is modelled for all localities but is switched on only for the Asian villages. Due to insufficient information, this process is modelled as a black box process for Labac and the two European localities as shown in Figure 13, for Huay Yai it is more detailed due to a better information base.

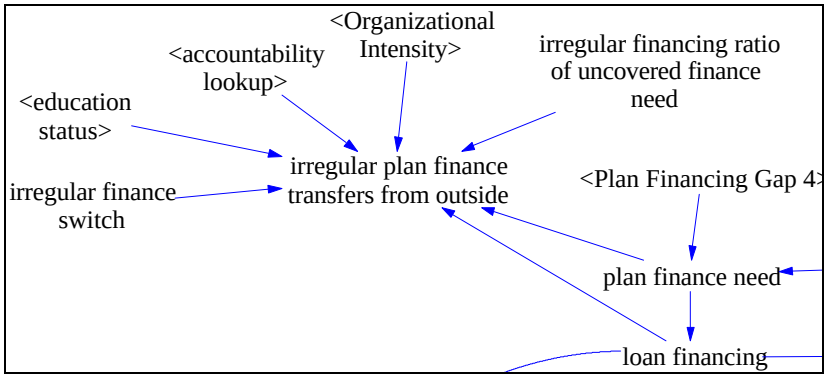


Figure 13: Financing Sub-Module for "irregular plan finance transfers from outside"

The correlation analysis of the field survey results revealed that the higher the education standard and the organizational intensity are, the more pressure is exerted on the local leaders to follow the rule of law, and thus with increasing education status and organizational intensity, irregular financing practices and public finance leaks are more and more constrained until they almost reach zero.

The accountability lookup takes care of the process. The output of this lookup function, which models villagers' accountability pressure, drives the irregular financing ratio down. This process is always activated, whether the villagers are finance empowered or not as

educated and organized villagers exert moral pressure on the leaders whether they are empowered or not. The irregular financing ratio shows the ability of the local leaders to find irregular financing and as this ability varies, it is modeled as a uniform random process. The ratio varies from 10% to 20% of the uncovered finance need, a figure that was confirmed in the field research.

Once the financing is secured, the actual local government expenditure budget has to be established. In Figure 14, the Zorita Municipal Council's plan decisions are tallied against available finances. In a first step each expenditure category is calculated as percent of the "Total Municipal Plan Decision" to result in the respective budget allocation factor.

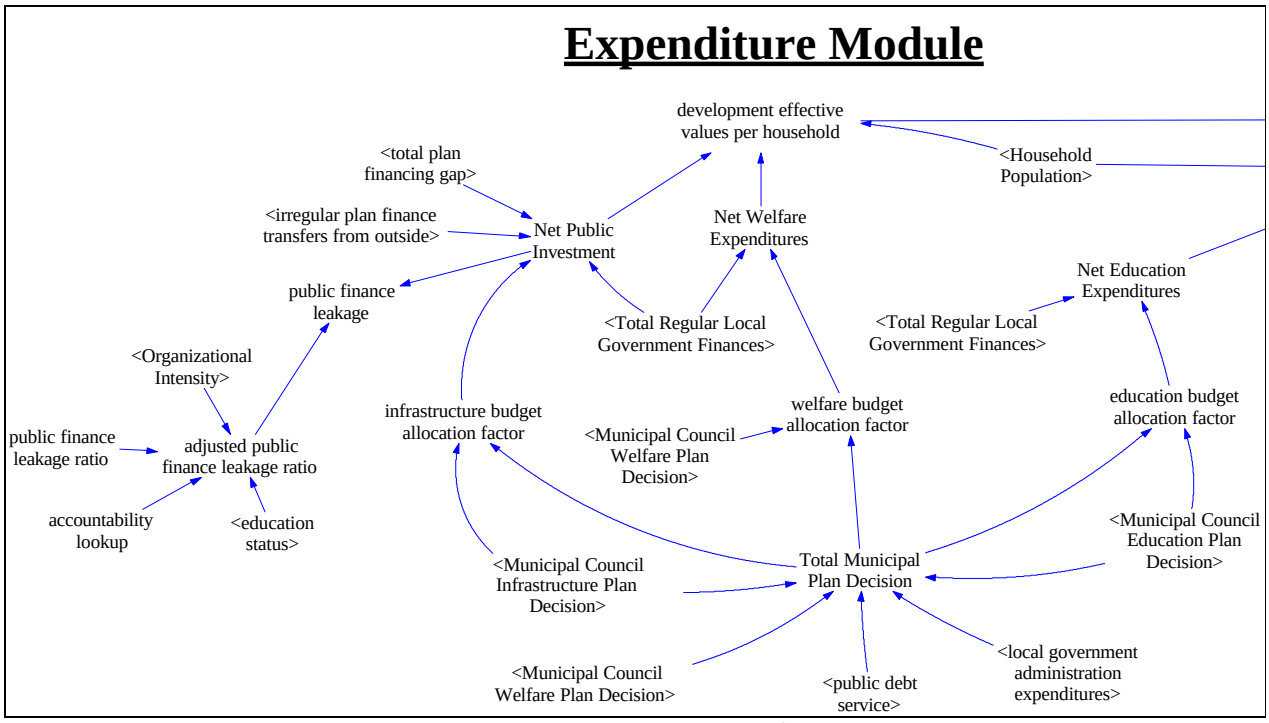


Figure 14: Public Expenditure Module of the Zorita Model

The factors for welfare and education are multiplied by the "Total Regular Local Government Finances". The results are the "Net Education Expenditure" and the "Net Welfare Expenditure".

Information from the field revealed that the irregular finances are more or less exclusively used for infrastructure projects, here called "Net Public Investment", and also unplanned budget surpluses are channeled into infrastructure expenditures. "Net Public Investment" is therefore the sum of the "irregular plan finance transfers from outside", the unplanned budget surplus (variable "total plan financing gap"), and the public investments financed through regular local government income.

The field research also revealed that finance leakage almost exclusively originates from infrastructure works. There are two forms of public finance leaks: overpricing of projects with kickbacks, the local leaders in the Asian localities called these kickbacks "commissions", and preferential treatment of local contractors even if prices are higher than those of outside bidders. Kickbacks are common in Huay Yai and Labac, whereas preferential treatment is prevalent in Zorita and Schwende. Public finance leaks are

constrained by the same mechanism as the irregular financing practices. Contrary to irregular financing practices, it is assumed that public finance leaks can never be eradicated completely. As no clear values could be established, it is assumed that the overpricing ratio amounts to some 10% for Zorita and Schwende; in Huay Yai and Labac the values given by respondents for such leakage and kick-backs amount to some 15%.

Now Net Public Investment and Net Welfare Expenditures are added and calculated as expenditures per household. The result is called development effective values per household. This value is then fed into the Development Transmission Module along with the education status.

Private capital investment is the source of jobs and employment. Particularly in Labac and Zorita villagers demanded from their local government job creation projects and the promotion of private capital investment. As can be seen from Figure 15, the two major determinants of private investment are tax rates, and the guarantee of the rule of law.

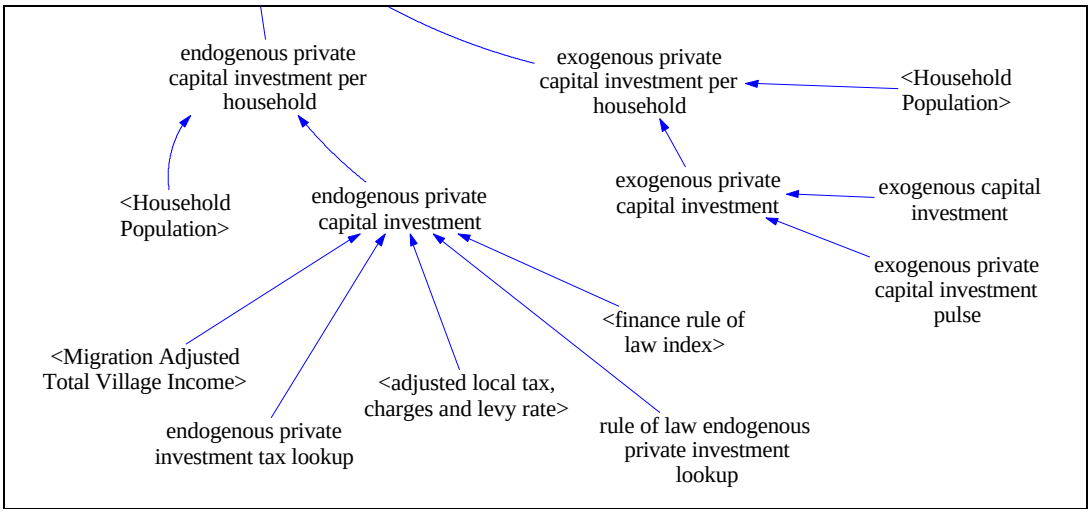


Figure 15: Expenditure Sub-Module: Private Capital Investment

The finance rule of law index measures the irregular finance practices in the locality. The index drives the „rule of law endogenous private investment lookup“ function. The larger the rule law index is, the larger is the law uncertainty in the locality, and the lower is the willingness of private investors to invest.

The second major influence factor on private investment are the local tax and levy rates. The higher these are relative to other localities, the more are prospective investers deterred from investing in the locality, the lower they are in relation to other localities the more investors are attracted. Tax rates are therefore considered a very important tool for local economic policy.

The output of the expenditure sub-modules is now fed into the income growth module to generate household population growth, income growth, and disposable household income as shown in Figure 16.

The local income growth process is assumed to follow the Barro and Sala-I-Martin (1995) and Barro (1999) cross-national income growth model. Barro and Sala-I-Martin base their

model on the Solow (1956), Swan (1965) and Ramsey (1928) growth models and on a neo-classical production function à la Cobb-Douglas with diminishing marginal products with respect to each input, constant returns to scale and with the validity of the Inada conditions,[2] enriched by government policies, human capital, and the diffusion of technology. Barro and Sala-I-Martin (1995, p. 421) define their function of a country's per capita income growth rate in period t, Dy as

Equation 7:
$Dy_t = F(y_{t-1}, h_{t-1};\ldots)$

Where y_{t-1} is initial per capita GDP and h_{t-1} is initial human capital per person (based on measures of educational attainment and health). The omitted variables denoted by "…." comprise a number of variables such as government policies, market distortions and others.

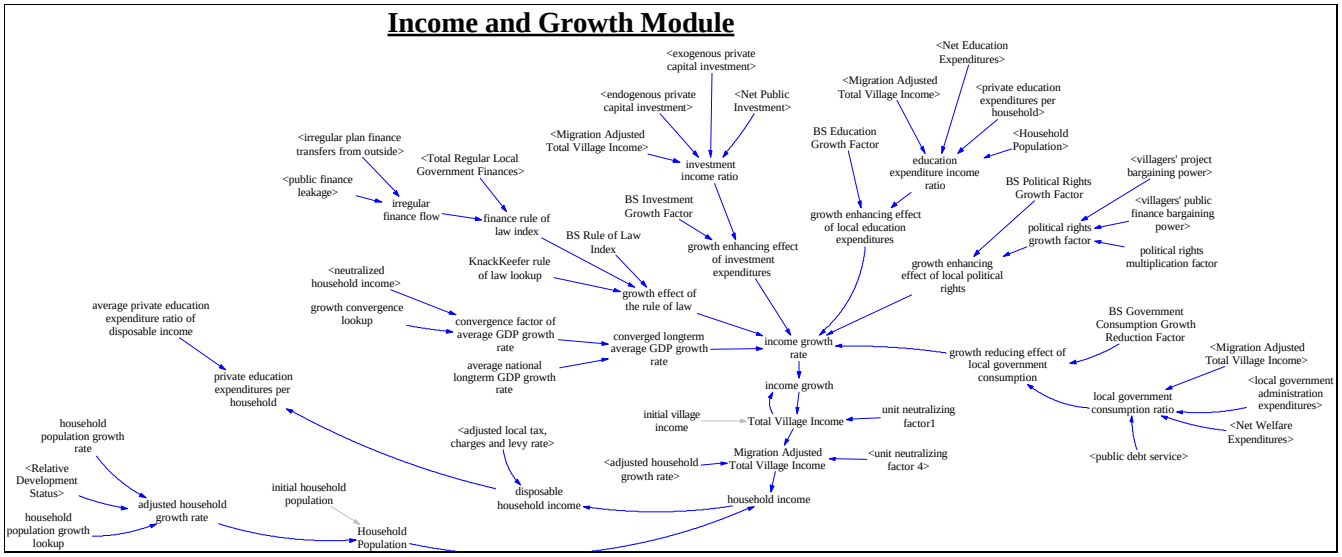


Figure 16: Income and Growth Module

Dy_t is assumed to decrease with increasing GDP and human capital per person, which is the standard observation of the behavior of growth rates where countries with higher GDP grow slower than countries with lower GDP. This function specification represents the growth rate convergence hypothesis described in Barro and Sala-I-Martin (1995).

For the present research it is assumed that the Barro and Sala-I-Martin (1995) regression parameters can also be applied to the local level and that it is admissible to superimpose the local growth rates on the national growth rate. This would explain why the development status within countries differs from region to region or even from locality to locality. It is assumed that the local growth rate is enhanced by those public policies the local government can control independently and by the private education expenditures and investments made in the locality. Each local influence factor is multiplied by the respective cross-country national regression factors of the Barro and Sala-I-Martin (1995) empirical

[2]which says that the marginal product of capital or labor approaches infinity as capital or labor goes to 0, and approaches 0 as capital or labor approaches infinity, or in simple terms, production cannot be performed with one input alone.

growth function, in the following called BS. There are six local growth producing equations:

- converged long-term average GDP growth rate (Equation 8)
- growth effect of the rule of law
- growth enhancing effect of investment expenditures
- growth enhancing effect of local education expenditures
- growth enhancing effect of local political rights (Equation 9)
- growth reducing effect of local government consumption

The sum of the growth effects of these processes is added to the converged long-term average GDP growth rate to result in the locality's income growth rate. The local income growth rate is determined by the six BS factors that are generally taken from the Barro and Sala-I-Martin (1995, p. 427/428) cross-country growth regression number 14 except the political rights/civil liberties coefficient, which is taken from regression number 13.

It is assumed that the convergence of growth rates theory as described in Barro/Sala-i-Martin (1995) and Barro (1999) also applies to the sample localities of this research. Barro (1999, p.47) writes: "Basically, 2 percent per capita growth seems to be about as good as it gets in the long run for a country that is already rich." It is therefore assumed that the per household income growth rates converge linearly to a level of 2% p.a. It is also assumed that the 2% growth rate is reached when a locality reaches the initial Schwende household income at the time of the research, which was US $ 40'000 per year.

The next growth factor is the rule of law. The finance rule of law index is expressed as the sum of public finance leaks and of irregular finances as percent of "Total Regular Local Government Finances". The growth effect is based on the Knack and Keefer (1995) country index prepared for the International Country Risk Guide, which is the basis of the Barro and Sala-i-Martin (1995) rule of law coefficient. The "finance rule of law index" of Figure 15 drives the "KnackKeefer (1995) rule of law lookup" whose output, multiplied by the "BS Rule of Law Index" produces the growth effect for the lack of the rule of law. According to Barro (1999, p.13) and Barro/Sala-i-Martin (1995, p. 439-440), improving the rule of law by one point on the 7 point Knack and Keefer scale contributes to the GDP growth rate 0.42%, and a transformation of this 7 point scale to the 0% to 100% scale of the "finance rule of law index" results in 0.42 * 7 = 2.93% for a 100% improvement in the rule of law. The BS Rule of Law Index is therefore expressed as adding 0.0293% to the converged GDP growth rate for a 1% improvement in the rule of law .

The remarkable thing of public and private investment is that its growth effect is quite contrary to common belief where one would expect investment expenditures to contribute most towards growth. Barro and Sala-I-Martin (1995) explain this low effect with the fact that the factor combines public and private investment and that the low productivity of public investment reduces the overall figure for total investment. Nevertheless, they point out that even if private investment is entered into the regressions separately, the effect is way below the effect of education. The reason for entering private and public investment combined is that most statistics do not clearly separate these two categories and to make data comparable the combined approach is generally followed. According to Barro/Sala-i-Martin (1995), p. 428, increasing public and private investment by 1%, contributes to the GDP growth rate by 0.03%.

The strongest growth effect is produced by education expenditures, particularly by the private education expenditures, as these do not have an upward effect on tax rates. According to Barro/Sala-i-Martin (1995), p. 428, increasing education expenditures by one percent, contributes to the GDP growth rate by 0.221 %.

Barro/Sala-i-Martin (1995, p.428 and 438f) calculate also a parameter for political rights and civil liberties (or what they call on p. 438f Democracy). Though they found that the factors have no statistically significant effect on growth ($p = 0.86$), the effect is assumed to be significant here, as in this research the origin for change is the granting of civil and political rights to the local villagers. The factor is based on a scale developed by Gastil (1987) with a range of 1 for no political rights to 7 for full political rights. In the models the villagers are neither "not finance nor project empowered", or they are empowered in one or the other, or in both. The empowerment scale in the locality models ranges from 0 for no rights, to 1 for either finance or project empowerment, to 2 for simultaneous finance and projects rights. The Gastil 7-point scale is therefore divided in 2 and thus, the political rights multiplication factor is 3.5. The BS Political Rights Growth Factor is 0.001% (Equation 9).

Though it is clear that particularly in developing countries public administrative institutions and processes must be strengthened, government consumption nevertheless produced in all country categories i.e. industrialized and developing, a similar negative growth effect in the Barro and Sala-I-Martin (1995) regressions. Barro and Sala-i-Martin (1995) include in government consumption all government expenditures except education and infrastructure investment expenditures; this convention is followed here. Thus government consumption is defined to consist of administration expenditures plus welfare expenditures and public debt service. According to Barro/Sala-i-Martin (1995), p. 428, increasing government consumption by 1%, reduces the GDP growth rate by 0.129 %.

Private education expenditures are also defined in the income growth module as they depend on the generated disposable household income. It is assumed that the "average private education expenditure ratio of disposable income" reflects the local culture towards education. It is therefore thought to be constant over a very long period. Private education expenditures are modeled to depend on disposable household income and thus there is a link to tax rates and villagers' project demands: the more they demand, the higher tax rates will be, and the less income will be available for education, this feeds back into the growth rate that determines household income and thus a new goal seeking circle of trade offs can begin.

In all four localities there was a negative household population growth rate in the past. Villagers had to emigrate to make a living. With increased local development and income prospects this trend is however reversed except in Zorita. But also there people and authorities are confident that the trend will be reversed in future due to greatly improved local economic prospects as result of development programs of the European Union. The household growth rate consists mainly of formerly local families moving back into the locality because of better economic and social prospects and not of an increased net birth rate. In all localities the household growth rates are empirical values, the growth rate changes are assumed.

Expenditures and income are then fed into the Development Transmission Module. In this module the sum of the development effective values is computed as relative value of

Schwende's initial perceived development status. This allows a clearer comparison of the four localities' developmental performance, and also readily provides information to what extent the three other localities are able to close up to the benchmark locality Schwende.

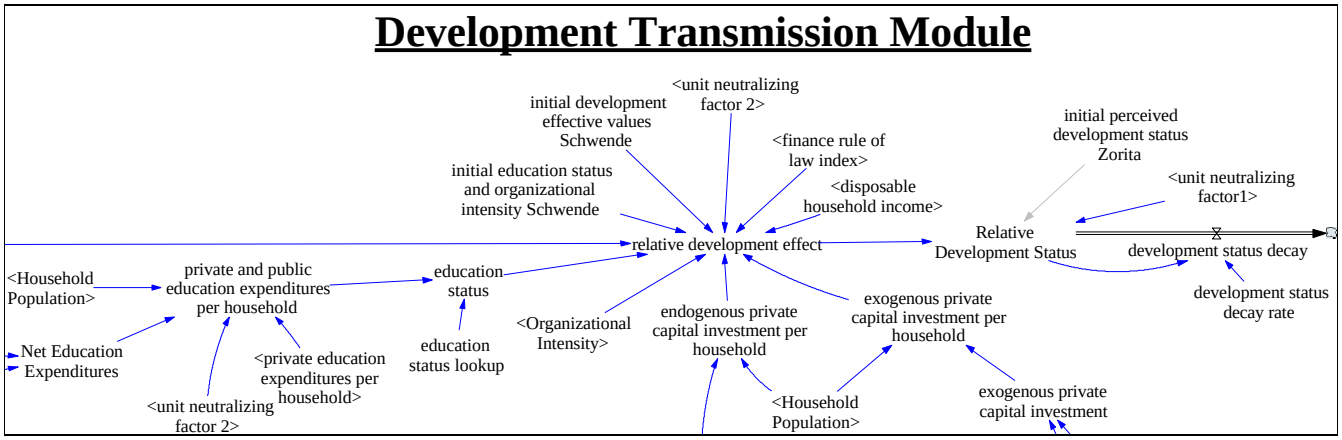


Figure 17: Development Transmission Module

Expenditures for education do not yet tell anything about educational attainment these expenditures produce. The education expenditures are therefore transformed into education status by a linearly rising lookup function that starts at the initial annual education expenditures per household at the time of the field research, which was $ 370 in Zorita that produced as output the initial average educational attainment of the villagers of 2.73 (see explanations to Figure 7). The lookup function increases this value with increasing private and public education expenditures to the maximum education attainment level of 6. The maximum value for education expenditures is chosen such that the average education level 6 (post graduate level on average) will never be reached.

Besides education status, organizational intensity is a very powerful influence factor in the political process and it is generally believed that a well-developed organizational network is the basis for empowerment and development. This factor thus is assumed, as described in the introduction, to be a prominent part of the development status. In addition, disposable household income and particularly private capital investment that is the basis for employment and income are also important factors of development status. It is believed that peoples' well-being is greatly dampened if the rule of law is not well enforced. The aggregated relative development effective values are therefore discounted by the lack of the rule of law. All these aggregated factors form the variable "relative development effect" of Equation 10. The result of equation 10 is fed into the final state variable "Relative Development Status".

The value of the initial perceived development status is the average development status assessment of the Zorita respondents. All new relative development effect increments are added to this perceived development status to form the new Relative Development Status. A once achieved development status decays over time. It is assumed that a development status would decay in 50 years. The Relative Development Status is fed back into the Empowerment Module, and if there is a discrepancy with villagers' development expectation, a new political process is triggered.

4 Local Government Policy Simulations

In this analysis the level "Relative Development Status" and the auxiliary "disposable household income are chosen as ultimate goals. For analytical purposes, 13 constants were chosen as policy variables. The criterion for suitability is that the constants are under direct or at least strong indirect control of the local government. The models were tested for sensitivity using two extreme values for each of the 13 policy constants. The results are used to determine how well suited a constant is to trigger change in the systems and therefore to determine the most promising policy variables for the local government of the sample localities.

A word for the interpretation of the graphs seems in place at this point: system dynamic simulation results as used in this study show tendencies and developments that allow to determine the most favourable system structure and policy parameters. It is not the absolute simulation result values that count, but rather the ranking of the results, and thus the percentage difference of one result to the other, and also the system structure, the cause effect chains and transmissions of policy changes.

All following figures measure on the horizontal axis simulation time that ranges from year 1 to year 50, and on the vertical axis the values of the figure's variable. At the bottom of each figure the simulation identifications are stated, where HY stands for Huay Yai, Lab stands for Labac, Schw stands for Schwende and Zor stands for Zorita. Added to these abbreviations is always the simulation code, which are v1 = full power, i.e. the villagers are given public finance and project decision power; v2 = no power, i.e. villagers cannot participate in the decision process; v3 = finance power, villagers are given decision power in public finance decisions only; v4 = project power, villagers are given decision power in project decisions only; thus Zorv2 indicates that this is the simulation for "no power" for Zorita. All curves are numbered and the respective curve numbers are shown next to the simulation identification. Finally, at the very right hand side of these identifications, the variable's unit of measurement is indicated.

Figure 18 shows the change of the development status of the four localities when their actual real systems are simulated for 50 years. The initial development status is the average of villagers' development valuation during the field research. It turned out that the initial valuations were inconsequential for the outcome after the 50 years simulation, i.e. the initial values for income and development status could have been 1 for all localities and the outcome would not have changed considerably. It is thus the system structure and process and what happens during the 50-year period that determines the final outcome. This result is of course greatly dependent on the growth convergence hypothesis that postulates a natural growth rate limit for very high development status' (Barro, 1999, p.47), thus allowing lowly developed countries to close up to highly developed countries if proper structures and policies are pursued. The graphs of Figure 18 show that Huay Yai, Labac and Zorita, in the following called "the others", are not able to close up to Schwende without fundamental policy changes. In fact it even appears that the gap between the others and Schwende is widening. Interestingly, Labac is able to close up to Zorita whereas Huay Yai is not.

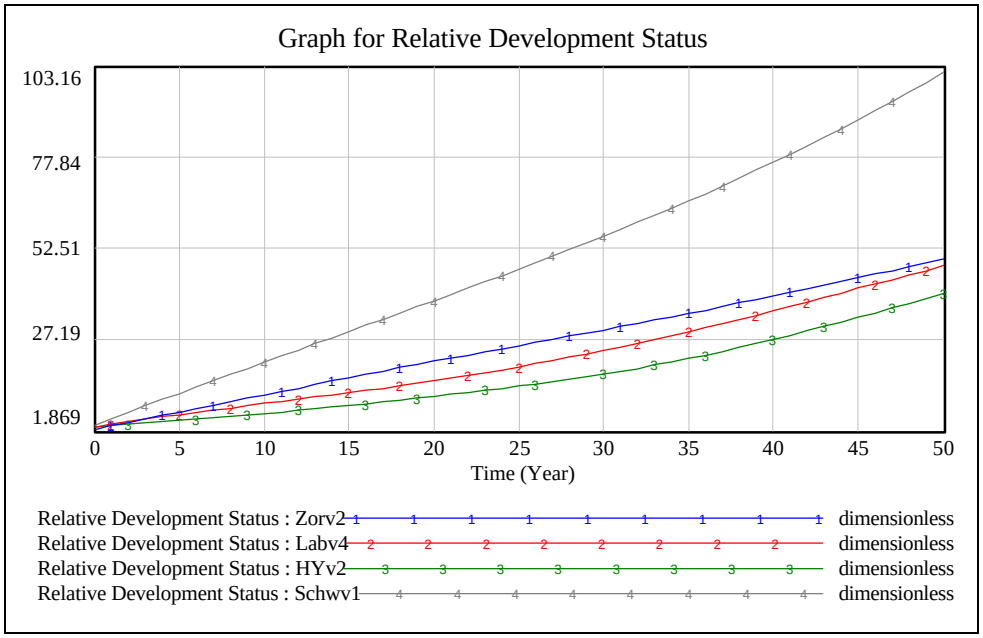


Figure 18: Relative Development Status of all Real System Simulations

The causes analysis shows that the major cause for Labac's closing up to Zorita is that it achieves constantly a lower value than Huay Yai in the variable "finance rule of law index" i.e. Labac has a better rule of law status than Huay Yai, and that at around time 30 Labac's rule of law status is even better than Zorita's. This indicates that in Labac the rule of law has improved most, which is caused by a generally higher "education status" and higher "Organizational Intensity" than found in Huay Yai and Zorita. In terms of income and capital investment on the other hand, Labac is mostly on the same level as Huay Yai but towards the end of the simulation period Labac falls below Huay Yai. The analysis for the causes of this shows that the higher Organizational Intensity of Labac reinforces Labac's "development frustration" more than in the other localities, which consequently leads to higher project demands that lead to a higher public finance need. This increases upward pressure on tax rates. Sharply increased tax rates on the other hand deter private capital investments in the locality and reduce disposable household income. Thus, the cause effect chain is closed.

Figure 19 shows a similar picture for Disposable Household Income. But here it is Huay Yai that successfully overtakes first Labac and then also Zorita. It however is clearly shown that the income gap between Schwende and the others is widening. The cause for Huay Yai's success stems mainly from a lower local government consumption ratio and much lower welfare expenditures than Labac and Zorita.

Also Figure 19 demonstrates that the "other" localities need to make fundamental policy changes if they want to close up to Schwende in terms of disposable household income.

The analysis shows that the winner empowerment policy in Huay Yai is policy v1 or full villager empowerment. The simulations of the Huay Yai model suggest that the effects on development status and disposable household income are very considerable when the real existing policy of no villager empowerment is changed to full empowerment, even without change in any of the other policy parameters. The model's development status improves by

17.8% and disposable household income by a whole 35.1% or expressed in months of economic activity, by 4.2 economic activity months.

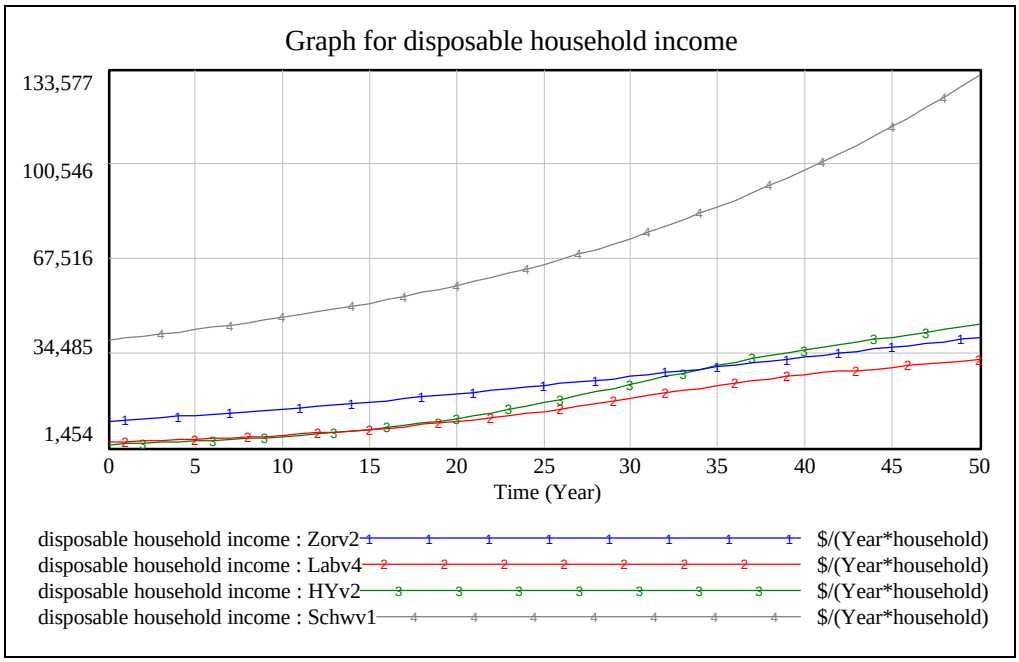


Figure 19: Disposable Household Income of all Real System Simulations

In Labac, disposable income of the existing real system could be produced in roughly ¾ of a year instead of working for it a whole year by giving villagers full empowerment (policy v1). The development status on the other hand could only be improved by some 5%. But it is also quite clear for Labac that the winner empowerment policy is “full power”.

In Schwende the picture clearly indicates the existing full empowerment status v1 as the winner empowerment policy.

The Zorita model outcome displays the most dramatic improvement from a change of the existing non-empowerment status to full empowerment (policy v1). Development status could be improved by 18% and disposable household income by 45.3% that would mean that the same income could be produced as before empowerment change in only half a year. Thus, full empowerment is clearly the winner policy for Zorita.

Figures 20 and 21 show the results of the winner policy simulations. Despite the indicated dramatic advances that could be achieved by the winner policies v1 in the model simulations for Huay Yai, Labac and Zorita, these are still not sufficient to overtake or even come near the development status or disposable income of Schwende. In terms of development status, the rank order of the four localities is maintained, but the gap between the Asian and the European localities seems to be widening. In terms of disposable household income, the most conspicuous result is that Huay Yai is able to overtake Zorita. An analysis for the cause of this indicates the much higher private education expenditure ratio in Huay Yai than the one of Zorita, and the heavy dependence of Zorita on public education expenditures that affect the local tax rates, to be at the core of this outcome. In Zorita public education expenditures at the end of the simulation period are roughly US$ 2’000 per household per year, whereas in Huay

Yai these are only $ 600. Private education expenditures per household per year on the other hand amounted in Zorita to $ 3'300 and in Huay Yai to $ 6'000. During the field research, it became obvious that the villagers of the Asian localities were traditionally always forced to take care of upper primary, and particularly secondary and higher education by themselves, as the state's provision of these services was minimal.

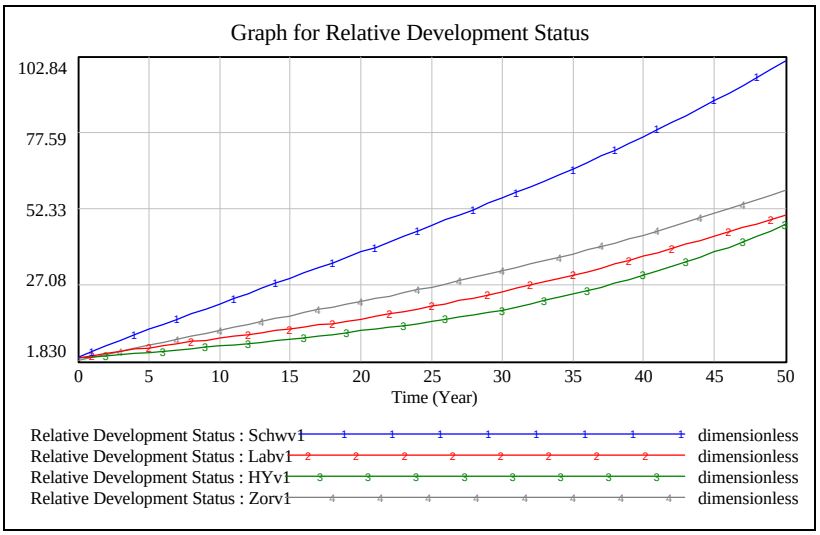


Figure 20: Winner Empowerment Policies Simulation of Relative Development Status

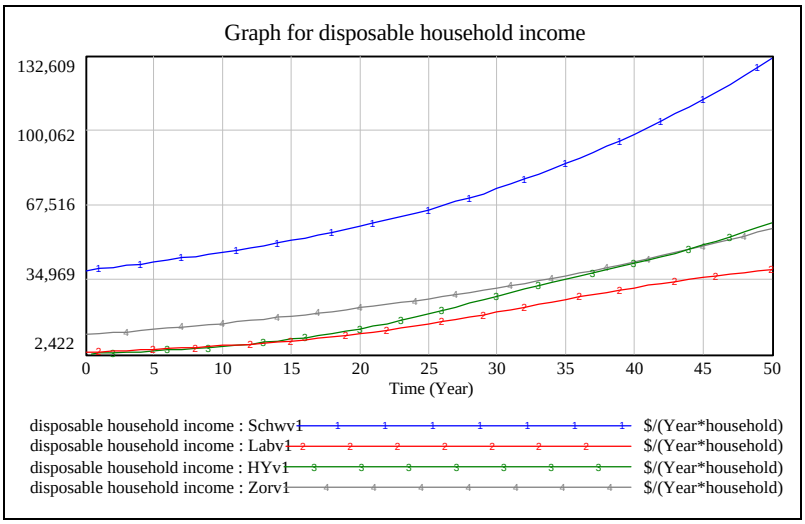


Figure 21: Winner Empowerment Policies Simulation of Disposable Household Income

The policy simulations reveal that

- increased private and public education expenditures combined with a
- higher organization ratio, defined as % of households that are members of an organization,
- low welfare expenditures,
- low infrastructure expenditures,
- low taxes,
- elimination of irregular financing practices,

- no or low public debts,
- low public finance leakage and
- increased exogenous private capital investment

add most to speeding up the local development process and to fast disposable income increases.

Though the simulations do generally follow the theory-based expectations, it is however rather surprising that drastically increased welfare expenditures do not result in a significantly negative outcome. Quite a big surprise is the effect of the public investment changes. Spending the whole budget for public investments produces everywhere slightly lower results as compared to the real system, whereas total abstention from public investments produces everywhere more or less positive effects. This effect is caused by the opportunities for irregular public financing and for public finance leakage offered by public investments that reduce growth and development status via the rule of law effect. A lower status of the rule of law causes reduced private investment flows, which result in lower household income growth and smaller development status increases. The strength of the policy effects differs however from locality to locality.

Though the extreme value simulations suggest that zero local taxes and no welfare expenditures result in higher disposable income and development, this is clearly not realistic for a modern state. As moderate infrastructure expenditures add to income and development and in addition welfare expenditures show only negligibly lower effects in all localities, it is assumed for a realistic simulation run that the Local Governments allocate 50% of their total regular local government income to education, and 25% each for infrastructure and welfare, and that the initial tax rate that has to finance these policies takes the average of the four localities' initial tax rate which is: (Huay Yai 5.81% + Labac 1.81% + Schwende 3.87% + Zorita 4.11%)/4 = 3.8% of "Migration Adjusted Total Village Income" for all localities. Low administration expenditures also result in significantly improved values. For the realistic simulations it is therefore assumed that all localities reduce administration expenditures by 50%. It is also assumed that the law forbids irregular financing practices and that public finance leakage, which can probably never be eliminated completely, is made more difficult through stricter accountability rules and can be reduced to a level of 5% in all localities.

The policy changes are superimposed on the winner empowerment policy and compared with the Schwende real system simulation. Additionally a simulation with only empowerment changed to v1 plus an inducement that villagers spend 20% of disposable household income for education was carried out.

The simulations showed that only the policy of increased private education expenditures is producing strongly positive effects if combined with policy v1. With all other policies, none of the localities is able to surpass Schwende in the two target variables "disposable household income" and "Relative Development Status". A second important observation is that in aggregated form, the policy changes that were superimposed on the full empowerment policy do not have great effects compared to a change in private education expenditures. In Labac in the variable disposable income, these aggregated policies even do not have any improvement effect at all.

Most remarkable is however that the simulations indicate that these policy changes would not actually be necessary. When the villagers are given full power and they can be induced by proper incentives to greatly increase their private education expenditures, Huay Yai is able to surpass Schwende in disposable household income and Zorita is even able to surpass Schwende in development status and disposable income.

5 Conclusions

Through this study, it was demonstrated that the combination of the methodologies of system dynamics, statistical and econometric analysis and social network analysis allows the construction of local governmental simulation models that provide more profound insights in the workings of politico-economic systems, particularly with respect to long-term effects of changes in the political and economic environment, than would be possible with each of the analytical methods used in isolation. Used as isolated tools, the methodologies could provide information on some functional relations (by use of statistics and econometrics), or organizational or social structures or powers (by use of documentary research and social network analysis), or on cause-effect chains with purely speculative simulation outcomes. Combined however these methodologies allow the construction of multiple cause-effect feedback systems whose time simulations provide a mix of hardened qualitative and quantitative information on long-term development trends of the politico-economic systems of the four sample localities. The use of system dynamics allowed the integration of soft data and functions into the simulation systems, along with hard statistical data, and the integration of power structures, derived through social network analysis.

The question whether similar results could have been reached with a conventional statistical or econometric approach still needs to be answered. Initial values and target variables need to be driven by time and behavioral and technical functions. It is particularly the behavioral and technical functions that require hard data for their derivation with statistical tools. Non-quantifiable behavior of councilors or villagers can only be determined through observation or in interviews. Observation is however not possible over a prolonged period of time and of a sufficiently large number of persons to allow statistical procedures such as regression analyses. System dynamics enables for such endeavors the construction of assumed functions based on observation, experience, plausibility or theory. In this research eight function complexes were constructed in which such assumed lookup functions and relations play a crucial role. These complexes are:

- derivation of villagers' influence powers,
- the planning process with villagers and councilors powers and changing need derivation,
- the local government financing process with local government tax adjustment process, villagers' tax countering pressure, upper governmental changing contribution process and debt financing process,
- irregular finance processes and villagers' constraint process,
- public expenditure process
- private investment and education expenditure process,
- income growth process based on the Barro and Sala-I-Martin (1995) research ,
- development effect and decay processes.

The politico-economic process comes to life through the interaction of these complexes in time. The reality of the models was checked by entering available 1960 values into the models and running simulations to the year 2000. The reality check indicator was household income in the year 2000. The final simulation household incomes differed from the actual year 2000 values between –18% for Huay Yai to +9% for Schwende. These values demonstrate that the models are able to forecast development trends accurately. With econometric models such precision can normally not be achieved over prolonged simulation periods such as the 40 years of this reality check, and with such a large number of influencing variables.

The research showed that devolution of powers in a direct democratic fashion to the villagers themselves creates the best results. The simulations demonstrated that people's empowerment, and public financial and planning policy variations matter very much on the local level; these can create competitive advantage for localities within a country or even when compared to localities of other countries. From a point of view of pure cause and effect of policy variations, the simulations revealed that there are no differences between the European and Asian localities: full empowerment of the villagers, a high organizational intensity, low taxes, constraining violations of the rule of law, high priority for education and moderate infrastructure and welfare expenditures combined with low or no public debt create the most beneficial outcome in all sample localities. It is particularly the legal framework that determines the structure and processes of a system, but also the values of the system parameters and functional relations, as well as villagers and councilors preferences that make the systems behave differently and to result in higher or lower target variable values.

Education, and there particularly private education efforts, turned out to be the major key to development and growth. Despite this fact, villagers did not mention education to be an urgent need, and if mentioned by the villagers, particularly in Huay Yai and Zorita, it is vocational education that is needed. Private educational efforts appeared to be superior to public educational efforts, because private education expenditures do not touch public budget and taxes, and thus with low taxes and increased educational status in the locality, private investments are lured in.

Equity concerns should however be built into a privately based educational system. This can be done with incentives, such as tax reductions and direct subsidies to needy people. Such measures require, that education administration must be as local as possible, as the financial and education program contents needs can only be assessed properly by administrators close to the local scene, and this means they must ideally be on the local or regional level.

Organization intensity, though important in the development process, is only of secondary importance in the dynamic process when compared to the effects of full empowerment and to a high private education expenditure ratio.

Corruption, irregular financing practices, or generally the lack of the rule of law are important growth deterrents. Even with strict laws and law enforcement, it will however be difficult to completely eradicate such behavior. The field research revealed that corruptive practices on the local level, even in the Asian localities, do not come near the figures circulated for the national levels. Judging from the information gathered, public finance leaks on the local level are well below 20 - 25% of the budget. The simulations showed

that indirect control via improved education that makes people more aware of the negative effects of corruptive practices, and a high organizational intensity are most effective in constraining irregular finance practices. Education works via more confident people who demand more accountability of their leaders, whereas organizational intensity bundles villagers' pressure and demands that cannot be ignored anymore by the councilors.

A major obstacle to local growth and development is a large local public sector, if it's financing must come mainly from local sources. The negative effects work on one hand through high tax rates, and on the other hand, through corruptive and irregular finance practices that shy away private investments. Locally financed deficit spending led generally to negative results due to the increase effects of debt services on the local government consumption ratio and that has negative effects on the local growth rate, even when the loans were totally channeled into education. For positive developmental effects of public sector measures, the finances must come ideally as grants from outside sources, in the same manner as a current account surplus would work at the national level.

Private initiative, be it on the educational or investment front, proved to produce the most positive developmental and growth effects. Local governments therefore should design a system of incentives for private initiatives.

It appears that culture, not education and income, seems to be one of the major obstacles to devolution of powers to the localities and to the villagers. This is most obvious in Huay Yai and Zorita. Both countries operate under a system of constitutional monarchy and both countries had a long history of dictatorial rule. Inherent in monarchies is a strongly stratified society with a historically, mentally and structurally firmly established top down administrative system. In Zorita in addition, traces of the rigid fifty-year Franco dictatorship can still be found in the thinking and mentality of the villagers, where church and police are still perceived as among the most powerful institutions in the village. It is therefore not surprising that in both localities the villagers are not project nor financially empowered, and that the villagers do not generally strongly challenge this. The survey results also suggest that the system of representative democracy is deeply ingrained in the minds of the villagers of Zorita and Huay Yai, and that one leaves the "ruling" to those "above", as some villagers stated in their responses.

Contrary to this, one finds in Schwende that villagers generally are critical of their leaders. The Schwende villagers are vividly aware that ultimate power rests with them, and not with the village council, nor with the upper governmental levels. Schwende's governmental culture might be termed as an extreme culture of devolution. Labac displays a rather Western styled political culture with actively involved villagers who make use of their limited referendum power.

To generalize above results, one might postulate that culture is no hindrance for devolution, but culture determines the pace for the devolution process. Also, one cannot generally categorize the localities into Asian and European, and derive from this an Asian or European government style. It is, however, the national culture and social system that is decisive for the speed on the path to politically empowering the people.

The simulation analyses revealed that economic consequences of devolution of governmental powers to the villagers are of an extent that responsible governments of these sample localities and countries should at least consider and analyze a policy of full villager

empowerment for their jurisdictions. In this new globalized and highly competitive world, inefficient or irrational use of scarce resources that lie at the root of low economic performance of countries and localities, will in future be punished even more severely by the national and world market. More efficient competitors are waiting all over the world for opportunity niches opened by inefficient producers that they could fill. As the simulations showed, the economies of the sample localities are not performing on their production possibility frontiers i.e. they are producing inefficiently, but it was also shown that empowering villagers and changing general policies bear great opportunities for improving on this situation. Full empowerment takes its way through demanding and enforcing projects and programs that are close to the needs of the villagers, which are often at odds with vested interests of the local councils. Rational and empowered villagers optimize tax burden and project demands. This leads to a favorable tax environment for private investment activities that create jobs and income, as a consequence higher private education expenditures are possible, which via an increased education status and higher organizational intensity constrain irregular public financing practices and enhance the rule of law, which has again positive effects on private investment and income.

Though these results represent only theoretical simulation results, they are however based on accurate partial models of the four sample localities, and thus bear certainly some relevance at least in terms of indicating trends. Real life one must unfortunately admit displays a strong inertia when behavior change is required, and it is exactly change that is required from all parties, councilors, villagers and upper governments to be able to harvest the fruits of such policy changes.

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7 Appendix

The Locality Profiles

Table 1: The Politico-Economic Ecology of the four Sample Localities

	Huay Yai, Cholburi, Thailand	Labac, Cavite, Philippines	Schwende, Appenzell I.Rh., Switzerland	Zorita, Caceres, Spain
Population	17'166	4'350	1'914	2'029
Number of Households	3'516	880	785	853
Average Household Income in 1998 US$	2'432	3'000	40'000	10'976
Regular Local Government (LG) Income from Local Taxes and Charges in 1998 US$ ('000)	496.7	37.5	1,216.5	384.8
Regular LG Income as percent of Total Village Income	5.81	1.42	3.87	4.11
Upper Government Contribution as percent of Regular LG Income	30.0	258.0	4.8	153.0
LG Expenditure Structure as percent of Total Budget				
Administration, Debt Service	17.1	35.2	16.0	33.0
Education, Culture	7.6	0.2	6.2	8.3
Welfare	1.0	0.3	19.7	5.2
Infrastructure	72.1	64.3	58.1	53.5
Savings	2.2	0.0	0.0	0.0
Local Political Structural Data				
Village Council	Sukhpiban (Tessaban Tambon) Council	Barangay Council	Bezirksrat	Consejo Municipal
Election mode	popular, secret ballot	popular, secret ballot	popular, open handraising	popular, secret ballot
Elected term	4 years	3 years	1year	4 years
Village Council Reports to	the provincial governor	the municipal mayor and villagers	the villagers' assembly	villagers who attend elections
Village Council is Controlled by	the office of the provincial governor	the municipal mayor	the villagers' assembly	by the provincial and regional controllers
Number of Councilors	11	11	7	11
Council has Executive tasks	yes	yes	yes	yes
Council has Legislative tasks	yes	yes, but conditional on popular referendum and acceptance by the Municipal Mayor	yes, but conditional on popular referendum	yes within the limit of the central state law
Referendum power of villagers	no	yes	yes	no
LG has Income Taxing Power	no	no	yes	yes
LG has right to set income tax rates	no	no	yes	very limited
LG has Indirect Taxing Power	yes, limited	yes, very limited	yes, very limited	yes, limited
LG has right to set indirect tax rates	yes, limited	yes, very limited	yes, very limited	no

A conspicuous difference among the villages shown in Table 1, is as expected the large differences in household income that is much larger in the two European localities than in the two Asian localities. The most striking fact is the high household income in Schwende, even though Schwende belongs to the group of the poorest localities in Switzerland. Table 1 also shows the insufficient local government income in Labac that is partly caused by the very low average tax rate, thus Labac is extremely dependent on upper government contributions. Also Zorita is heavily upper government dependent despite the much higher tax rate there. On the other extreme is Schwende which is practically upper government independent in terms of local budget financing. The expenditure structure of these local governments shows that the largest amount goes generally into infrastructure projects in all localities and apart from Schwende the second largest position of the budgets is administration.

Through the villagers' referendum right, the Schwende and Labac local governments are theoretically the most constrained localities in terms of villagers' power. An extremely constraining institution is the annual accountability and election assembly practiced in Schwende, which allows the villagers to control their local government very effectively. Unfulfilling leaders are, as the survey results revealed, normally simply not reelected. In all four localities the village council has executive and to some extent also legislative power. Only in Schwende and to some extent also in Zorita has the local government the power to set local taxes and tax rates by themselves, in Huay Yai and Labac taxes and rates are fixed in the respective national laws. Though Huay Yai and Labac are forced by law to establish a medium term development plan, only Huay Yai follows this law, the other three localities only establish an annual budget, with Zorita declaring a political four year program that serves the villagers as accountability yardstick during elections. The only place where plans and budgets are not coordinated with upper government at all is Schwende.

Equations

Equation 1:
Organizational Intensity$_{t+1}$ =
organizational intensity lookup(neutralized household income$_{t+1}$)*villagers' organization ratio

Equation 2:
leviathan control =
1) IF THEN ELSE(villagers' public finance bargaining power=0,
2) "administration long-term average allocation factor in % total regular local government income",
3a) IF THEN ELSE("adjusted local tax, charges and levy rate">initial long-term overall local tax and levy rate,
3b) "administration long-term average allocation factor in % total regular local government income"-("adjusted local tax, charges and levy rate"-initial long-term overall local tax and levy rate),
3c) "administration long-term average allocation factor in % total regular local government income"))

Number 1) is the condition which states, if the villagers have no finance power, i.e. the power switch carries the value 0, then Number 2) applies, else Number 3).

Number 2) states that the customary long-term administration allocation factor has to be applied. The long-term allocation factor is taken from the local government budgets, and it is assumed that those allocations represent what is customary and acceptable in the localities.

Number 3) applies if 1) is not equal to 0. Number 3) is the villagers' administration budget control if they are given public finance power, i.e. they are either granted referendum rights in public finance matters, or local public budgets must compulsorily be presented to the villagers for acceptance, as is often practiced in small communities in Switzerland.

Number 3a) states if "adjusted local tax, charges and levy rate" is larger than the "initial long-term overall local tax and levy rate", then 3b) applies. Number 3b) states that the customary administration expenditure allocation factor has to be reduced by the excess of the adjusted local tax and levy rate over the initial long-term tax rate. If the "adjusted local tax, charges and levy rate" is smaller than the initial long-term overall local tax and levy rate, then 3c) applies, which simply says that in this case the customary "administration long-term average allocation factor in % total regular local government income" applies.

Equation 6:
Municipal Council Education Plan Decision =
IF THEN ELSE(villagers' project bargaining power=0,
total regular local government income*"education long-term average allocation factor in % total local government budget"*(1+relative Municipal Council Welfare Clique Power), project empowered education allocation factor*(1-"adjusted local tax, charges and levy rate")*total regular local government income)

Equation 3:
project empowered education allocation factor =
IF THEN ELSE(development adjusted education needs<"education long-term average allocation factor in % total local government budget",
"education long-term average allocation factor in % total local government budget",
((development adjusted education needs*(villagers' project pressure+relative Municipal Council Welfare Clique Power))-(development adjusted education needs-("education long-term average allocation factor in % total local government budget"*relative Municipal Council Infrastructure Clique Power))))

Equation 3 states if villagers' education allocation demands are smaller than the long-term allocation, the long-term allocation will prevail. If however their allocation demands are equal or higher than the long-term allocation, then the process of part three of the equation evolves, which says, villagers' development adjusted education needs are reinforced by the sum of their project pressure and the welfare clique power; this is countered by the reduction demand of the infrastructure clique.

Equation 4:
development adjusted education needs =
education needs lookup(Relative Development Status)*villagers' education needs according to Q30

Equation 5:
project empowered infrastructure allocation factor =

IF THEN ELSE(development adjusted infrastructure needs<"infrastructure economic and environment long-term average allocation factor in % total local government budget",
development adjusted infrastructure needs+("infrastructure economic and environment long-term average allocation factor in % total local government budget"*relative Municipal Council Infrastructure Clique Power),
development adjusted infrastructure needs*(villagers' project pressure+relative Municipal Council Infrastructure Clique Power))

Equation 6:
Municipal Council Infrastructure Plan Decision =
IF THEN ELSE(villagers' project bargaining power=0,
total regular local government income*"infrastructure economic and environment long-term average allocation factor in % total local government budget"*(1+relative Municipal Council Infrastructure Clique Power),
project empowered infrastructure allocation factor*(1-"adjusted local tax, charges and levy rate")*total regular local government income)

Equation 8:
Converged long-term average GDP growth rate =
average national long-term GDP growth rate*convergence factor of average GDP growth rate

Equation 9:
political rights growth factor =
(villagers' project bargaining power+villagers' public finance bargaining power)*political rights multiplication factor

Equation 10:
relative development effect =
((((development effective values per household + disposable household income + endogenous private capital investment per household + exogenous private capital investment per household) / initial development effective values Schwende) * unit neutralizing factor 2) + ((education status + Organizational Intensity) / initial education status and organizational intensity Schwende)) * (1-finance rule of law index)

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