



Sustainable Innovations by Small and Medium Enterprises

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It is discussed how sustainable innovations can be organized on a regional level that is in Friesland, the Netherlands. By linking small and medium size enterprises with each other and with experts, fifteen projects are developed for tourism and spatial development with participation of sixty five organizations. Five projects are implemented, seven are under preparation and three delayed. The experiment shows that corporate social responsibility is a business opportunity and that the clustering process, though laborious, is rewarding because of a more sustainable income growth.

1. Introduction

The background of the paper is an attempt to foster corporate social responsibility by the Frisian region, the Netherlands (about 0.7 million people). It is implemented by assisting small and medium size enterprises with development of new products and services that contribute firms' profitability, social welfare and environmental quality, abbreviated sustainable innovations. Hence, the policy underlines the corporate social responsibility as a business opportunity in the regional context. The provincial policy on sustainable innovations is framed by agendas of the European Union on productivity and social



inclusion (Lisbon agenda, 2000) and on good environmental quality (Gothenburg agenda, 2001) that are elaborated in the European policy on regional development (2003)¹.

The innovations are considered in terms of Schumpeter (1953, 1989:59), which is 'doing things differently' including new tools, methods, products, services and images². The regional context for the innovations implies use of the specific social and natural qualities in an area for business development. The qualities constitute an asset that enables development of individuals' and groups' skills often (called 'tacit knowledge')³. Hence, innovators can be businesses and technology centers with formal means, like research budget as well as individuals, groups and enterprises without the formal means for innovations.

At the start of the project it is expected that the innovations can be organized by tuning specific skills that add value to each other starting from users' perspective. The argument for this behavioral view on the innovations is that result of an innovation process is highly uncertain beforehand but it needs many inputs of various stakeholders such as potential suppliers and customers, institutional services and policy makers, which means that investment in innovation is a risk for innovator and all participants in the process that is only taken under outstanding conditions. The regional context facilitates search for participants, finding willing clients, generation of expertise, getting funds, political support, so on. The research question is whether the sustainable innovations can be organized on a regional level, or what conditions are needed for that.

The paper discusses the question based on experience with fifteen innovation processes that are organized in the period mid-2002 to mid-2006 in the Frisian province. On request of the policymakers, organization of the sustainable innovations is focused on tourism development and new uses of space in the region. The aim is to transfer an idea of an entrepreneurs, or an expert into a plan for a new product, service and business (invention), followed by successful introduction of the invention in a pilot (innovation). The project ideas are accepted if they contribute to corporate social responsibility in the sense of potential major social and environmental improvements in the region and if the

¹ European Union Regional Policy, *Competitiveness, sustainable development and cohesion in Europe; from Lisbon to Gothenburg*, European Commission, 2003.

² Schumpeter, J.A., (1939), *Business cycles*, Porcupine Press, Philadelphia, 1989.

³ Malecki, E.J., *Technology and economic development*, Longman Scientific & Technical, United Kingdom, 1991.



ideas have gained interest of several stakeholders, out of them minimum two participating entrepreneurs. The researchers have acted as organizer of the innovation process and, together with policymakers, reflected on the results. The organized projects are mainly new products, services and even new businesses ('out of the box innovations') as to oppose to a few organized adaptations of past activities ('in the box innovations'). We describe the projects aiming to generate sustainable innovations case by case in section 2, thereafter reflect on the possibilities and impediments to indicate commercial possibilities in section 3 and draw conclusions in section 4.

2. Projects

Fifteen projects are organized that are shown in Table 1. Eight projects address spatial development (s), seven projects address tourism development (t). We present the projects case by case in historical order of idea generation. The following is briefly described: the goal, the starting point, the source of idea, pivotal events, organization setup, funding proposal, expected cost, expected revenues and phase in implementation.

Spatial development

The "Networked Society" is purposed to use broadband for virtual services for households, education and at work, like shopping, distance learning in rural areas, mobility of peoples and so on. A group of experts presented the idea in 2003 to several stakeholders but only three years later 5 organizations in 2 municipalities have reached a preliminary agreement on a plan for pilot. The pilot would cost about € 1 million with a similar potential reward based on 10.000 subscriptions each paying €100 per year for the services. The pilot is expected to take off in 2007.

The "Village Centers" aims to restore buildings in rural areas for multifunctional use, like culture, education and care. The idea comes from an entrepreneur willing to maintain services in villages and overcome problem of traveling of less mobile peoples such as elderly and handicapped. Contacts are made with local schools, care centers and the organization of villagers in the region. Two entrepreneurs and policymakers have shown interest but it has been difficult to translate the idea into a business plan because of poor entrepreneurship and low earning power of the diluted rural population.



The “Farms for Care” aims to combine work and education for peoples with limited abilities on the countryside, and so, shorten the list of waiting for facilities and create extra income of farmers. The initiative comes from an expert. Contacts are established in 2004 with agricultural, social work experts and teachers of disabled. Two organizations have shown interest to start the facilities but it is found difficult to organize a business plan and find a leading entrepreneur.

The “Frisian Aqua Fair” aims to establish agreements between decision makers about management of a water body such as a lake, or sea. The idea comes from an expert. The initiative from 2004 is supported by five organizations that agreed to co-operate. A proposal is drafted, submitted for co-funding and approved in one year. The cost is € 0.2 million with 45% grant and projected revenue is € 1 million due to new projects. The project is in progress.

The “Village transport” aims at cheap short-distance travel for elderly people. The idea comes from management of an elderly home that acts as entrepreneur. In 2004, several entrepreneurs are approached without much success, but one year later a group of four organizations is established to draft a proposal for funding a pilot. The indicative costs of the pilot are € 0.2 million and revenues about € 0.3 million euros, based on 1.000 users on 150 days a year for € 2 per day.

The “Street Events” aims use of public space in a small town for culture and sports to strengthen social cohesion and economic development. The initiative is taken by an expert. In 2004 several sport and cultural organizations are approached that have shown interest to co-operate but little leading capability, which has caused delay in the development. A similar initiative is under development in another town.

The “Lotus for Friesland” aims to develop aquaculture in co-operation with Chinese experts for Lotus cultivation. The initiative comes from entrepreneurs, a group of farmers searching for new products. In 2004, contacts are established with Chinese experts that have indicated Lotus varieties for moderate climate areas. The entrepreneurs have shown interest and a pilot costing € 0.05 million is suggested but the companies did not take the lead.

“Marsh mellow in Friesland” aims to cultivate marsh mellow as a natural sweetener and flavor. Two entrepreneurs mentioned above initiated the project in 2004. Research



into marsh mellow market indicated production perspective. A pilot costing € 0.05 million is suggested with roughly equal revenue based on a share of the Dutch marsh mellow market but the companies did not take the lead.

Tourism development

The “Virtual Tourist Office” aims to establish a virtual tourist information system on island of Ameland as a marketing model for the Wadden sea area (embracing Denmark, Germany and the Netherlands). The idea comes from an entrepreneur on the island. The contacts that started mid-2002 have generated much interest of local entrepreneurs. Fourteen organizations agreed in 2004 to implement a pilot costing € 0.5 million with revenue of about € 1 million, based on 5.000 extra tourists spending € 200 each on the island. The request for 40% co-funding is pending because a few politicians are anxious about the level playing field for competitors, but the pilot is expected to start in 2006.

The “Wadventures” aims to develop boat tours on the Waddensea for students that can combine learning about nature by practicing modern technologies for communication and sensoring. The idea of experts is discussed with a few entrepreneurs and educational institutions in 2002. Six organizations translated the idea into plan for pilot in 2004. The costs of the pilot are estimated to be € 0.25 million, revenues € 0.4 million based on 10 touring ships. The co-funding of 40% of the cost is granted only after one and a half year. The project is under execution and progresses well.

The “Care and Tourism” is purposed at centers for handicapped and patients after hospital treatment. The idea comes from entrepreneurs, aiming at revalidation centers in tourist areas. Two organizations agreed to co-operate but attempts to translate the idea into a project have not been successful because a leading entrepreneur is not found. Recently, the entrepreneur has made a new similar proposal, but economic details are still not available.

The “Solar power sailing” aims to apply solar cells for stand-alone electricity on yachts, which would foster cleaner tourism. The initiative is taken by an entrepreneur that constructed a prototype of solar cell yacht. In 2003, co-operation is developed between the constructor and a sailing school. One year later, proposal for a pilot is made costing € 0.05 million with expected cost coverage due to extra sailing lessons and 50% grant is



provided in a half year. The project is executed and evaluated. Some qualities of the yacht are going to be adapted for scaling up.

The “Chinese tourism” aims to deliver leisure-business tours along outstanding waterworks and agriculture for Chinese businessmen that visit the Netherlands. The initiative is taken by an entrepreneur in 2004. Market research has shown interest of the Chinese businessmen for a day tour and a dozen of Chinese journalists that have visited Friesland have underlined the opportunity. A proposal is drafted for a pilot costing € 0.2 million with the expected revenue of € 0.25 million for 5.000 visits a year, paying €50 per visit. Seven organizations have shown interest to participate but none has taken the lead, so far.

The “Wetter Bus“ is developed to bring tourists along natural and cultural attraction on antique busses, thereby reducing car travels. The initiative of tour operator in 2004, has received support of several organizations. Shortly after the contact, four organizations drafted a proposal costing € 0.2 million and potential revenue of € 0.25 million due to 5.000 tourists a year spending €50 a day. Co-funding of 50% is approved within half year. The pilot is executed in 2005 with positive results. The project is in process of scaling up.

The “Electric sailing” aims to introduce electric boats. The initiative comes from a few entrepreneurs to promote electric boats. In 2005, five organizations agreed to develop a hydrogen fuel boat within the framework of the Solar Frisian Nuon Challenge, which is a solar boats race in Friesland. A proposal is drafted costing € 0.05 million with unknown revenues. It is funded within half year. The boat sails but there are quality constrains for scaling up.

2. Possibilities of sustainable innovations

The possibilities of sustainable innovations are discussed with regard to the results and economic effects of scaling, followed by some key conditions for the innovation.

Results

It is possible to organize sustainable innovations on a regional level. The result is fifteen projects with large social and environmental contributions such as care about disabled,



low pollution, awareness about nature and so on. Only three ideas are delayed, only one of them is stopped. Twelve ideas are translated into inventions, which are plans founded by feasibility assessment. Out of them, seven inventions are in preparation for a pilot and two pilots are under execution. Three pilots are executed and evaluated with a possibility to scale up, two of them are breakthrough innovations that are the solar sailing boat and the hydrogen sloop. The costs of the plans for pilots are € 3.2 million at expected revenue of € 4.75 million, whereas the organization costs € 0.06 million (a few thousand euro per project), which is below 5% of the cost of implementation.

A positive indirect economic effect of organizing sustainable innovations is that many entrepreneurs have sensed business opportunities of corporate social responsibility, albeit it is not promoted as such. Eleven projects are proposed by entrepreneurs, five by experts. The ideas have attracted 65 participants, out of a few hundred contacts. Most participants are small and medium size enterprises. It indicates that many entrepreneurs are willing to invest in development of products and services that contribute social goods although the rewards are highly uncertain. The effects on the policymaking are less clear. The results are appreciated by the responsible politicians but translation in policymaking is still pending.

The pilots provide opportunities for activities on regional scale and broader, but forecasting must be done with cautious because of market and quality uncertainties. The pilots are scaled up only on the regional level to illustrate potential economic effects of the sustainable innovations on the regional economy. The escalation is based on historical data, taking into consideration that scaling up can reduce the prices. The results and the assumptions are presented in Table 2. The annual revenues of the sustainable innovations on the regional scale approximate € 45 million euros, out of it 56% by the projects in spatial development, which is nearly 5% of the total annual gross regional product. The revenues provide some 1.500 jobs annually, excluding the jobs created by investments. These are notable effects for the regional economy.

It should be noted that the research only covers two sectors of regional policy that are spatial development and tourism. The sustainable innovations can also be developed in many others areas such as energy and water management. These sectors provide even larger opportunities for economic development but they are not cover by the research.



Conditions for innovation process

The key factor for sustainable innovations is finding an entrepreneur who is capable to take the lead in the process. The leading partner should be an entrepreneur, not an expert. On the contrary, a dominant expert can push out entrepreneurship and impede progress, like it is happened in case of “Farms for care”. Searching and motivating leading partner is laborious. The search via networks is usually found inadequate because it is too much dependent on incidental contacts. However, a better method was not available but should be developed. The search for a leading entrepreneur benefits from a stream of events that promote sustainable innovations because it encourages risk taking. For example, several projects on urban water in the region have been instrumental for the “Frisian Aqua Fair project” and similarly, attention for the Frisian Nuon Solar Challenge invoked building of the hydrogen sloop in the “Electric sailing” project. The project ideas that stand alone have low chance of success, like it happened with several ideas for spatial development.

Another important factor is structuring of interaction between entrepreneurs and with experts as to differentiate from research and development efforts. Most innovations in the experiment are based on entrepreneurial skills with limited input of research and development, but only a few projects have received support of the academic research. The ones with the research support have not been more successful then without research. On the contrary, much research and consultancy loads the ballasts idea with unnecessary checkpoints, like it occurred with the project “Chinese tourism”. More important have been input of academic experts from various institutions, in addition to entrepreneurial skills. Market interactions are most valuable. Particularly the interactions between users and developers of new products and services are instrumental. A difficulty in organizing sustainable innovations is finding a method how to structure the interactions that tune the skills and cultures of the potential participants to achieve high value chain.

Time is money also holds for sustainable innovations. Time and again it is found that half year preparation period is sufficient to elaborate a robust plan for a pilot and that a long preparation period hardly contributes successful pilot. So many checklists used by financiers satisfy curiosity of evaluators rather than contribute to successful financing. A



few key indicators value, many other is waste contending process like it happened with “Virtual Tourism Office”.

Financing of pilots is obviously relevant. The costs vary from € 0.05 million to about € 0.2 million. The costs are so low that any region can co-finance the sustainable innovations. The state co-financing is indispensable for innovations because it signals political support to the participants who invest and wait to get a reward, in addition to lowering project costs. The difficulty about co-financing innovations is that it entails a political risk that rewards of innovations are accrued by politicians after next elections because the innovation process is usually longer than the elected period. The politician and managers having cold feet about the innovators, often favor adaptations that can be fulfilled at less risk in a shorter time, like in case of the “Wetterbus”.

Conclusions

The question is discussed if and how the sustainable innovations can be organized in a region. The discussion is based on experience with implementation of fifteen socially and environmentally attractive projects in the Frisian region. The answer to the first question is positive. It is shown that (a) the sustainable innovations can be organized project-wise by linking individual entrepreneurs and with experts whose skills add value to each other, (b) that results of the implementation contribute to economic development, (c) that costs of organization of the process to foster the sustainable innovations are low, (d) that the process can be successful in many regions if the organizers tune to the skills available in the region. Based on the experience, we argue that a few steps determine opportunities for the sustainable innovations.

The key step is translation of an idea into a workable plan. The idea generation is an event but insufficient for action. A novelty must be embedded in the skills available in the region. The challenge, therefore, is to identify skills and ways to tune novelties with them. Schooling of entrepreneurs and meeting points for novelties can be valuable policy instruments to foster sustainable innovations.

Secondly, a working plan needs participants that invest time and money despite of uncertain rewards of the efforts. The participation in sustainable innovations needs policy making because social qualities are largely not reflected in prices but they are regulated.



The participation can be encouraged by regional policies that facilitate events to launch novelties and promote the innovations.

Thirdly, sustainable innovations require co-funding for organizing the innovation process and for implementation of inventions in pilots because risk of untested novelty is usually too high for commercialization. Co-financing is a signal of public appreciation. The public costs are usually so low that it is hardly obstacle in most regions, whereas the scaled up rewards can generate sustainable economic development.



	name	Aim	start	from	act	result	the barrier	cost	revenue	assumption for revenues
s	Networked Society	broad band for virtual service	2003	experts	5	preparation	lacking leader	1	1	10.000 subscribers*€100/a
s	Village centers	multifunctional rural buildings	2003	entrepreneur	2	delay	lacking leader	N.A.	N.A.	not assessed
s	Farms for care	work and learn for handicapped	2003	experts	2	delay	lacking leader	N.A.	N.A.	not assessed
s	Village transport	cheap short distance transport	2004	entrepreneur	4	preparation	lacking leader	0.2	0.3	1.000 users*150 days*€2/d
s	Street events	Public space for culture and sport	2004	experts	2	delay	lacking leader	N.A.	N.A.	not assessed
s	Lotus cultivation	aquaculture with chinese experts	2004	entrepreneur	2	preparation	lacking leader	0.1	N.A.	not assessed
s	Marshmallow	aquaculture for flavours	2004	entrepreneur	3	preparation	lacking leader	0.1	N.A.	1% Dutch market €0.06 mln
s	Frisian Aqua Fair	agreements on management of water bodies	2004	experts	5	execution	uncertain sale	0.2	1	extra foreign projects
t	Care and tourism	revalidation in vacation housing	2002	entrepreneur	2	preparation	lacking leader	N.A.	0.5	200 revalidates/a*10d*€250/d
t	Virtual tourist office	internet-based model marketing	2002	entrepreneur	14	preparation	bureaucracy	0.5	1	extra 5.000 toerists*€ 200 pp
t	Wadventures	high tech tours on sea	2002	experts	6	execution	bureaucracy	0.3	0.4	10ships*10tours*20p*5d*€40/p
t	Solar power sailing	stand-alone electra on yachts	2003	entrepreneur	2	evaluated	poor product	0.1	0.05	500 extra courses*€100/course
t	Chinese tourists	tours for chinese businessmen	2003	entrepreneur	7	preparation	lacking leader	0.2	0.25	extra 5.000 toeristen/j*€50/p
t	Wetter bus	bus tours for nature and culture	2004	entrepreneur	4	evaluated	bureaucracy	0.2	0.25	5.000 extra touristen*€50/d
t	Electric sailing	promotion electric boats	2005	entrepreneur	5	evaluated	poor product	0.5	N.A.	not assessed
	Total				65			3.20	4.75	



Table 2 Scaling up of the project of Sustainable Innovations			
	name	€ mln	assumptions for scaling up in 4-5 years
s	Networked Society	10	500.000 subscribers* €20/a
s	Village centers	0	P.M. 500ateliers*200m2*€50/m2/a (like churches)
s	Farms for care	0	P.M. 1.000p/a*€2000p/a
s	Village transport	2	5.000users*200days*€2/d
s	Street events	10	P.M. festivals 50.000p/festival*€100/pp
s	Lotus cultivation	0	P.M. aquaculture by 50 farmers*€0.2mln
s	Marshmallow	0	P.M. 25% of the Dutch market
s	Frisian Aqua Fair	3	1% extra turnover water sector
t	Care and tourism	5	2000 revalidaties/j*10dagen*€250/d
t	Virtual tourist office	7	5% extra spending visits
t	Wadventures	1.6	20ships*20tours*20students*5d*€40/p.d
t	Solar power sailing	1	extra 10.000 visits*€100/p
t	Chinese tourists	5	extra 50.000 foreign visits*€100/p
t	Wetter bus	0	P.M. arrangementen a la Mopark for € 2 mln
t	Electric sailing	0	P.M. Waterzap for 200.000 visits*€100pp
		44.6	

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