# Settlement development and the formal, informal and subsistence sector in the Arctic

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**Abstract**

*The development of the settlement structure in the Arctic is influenced by several processes. On one hand it is highly structured by relations to the Euro-American capitalism and the development of the tertiary - or the "next" - sector. On the other hand, the traditional subsistence economy as well as the informal economic relations are crucial ingrediences when trying to understand the present development process.*

**Keywords**

*Arctic development, Settlement structure, Subsistence, Informal economy.*

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In his book, "Subsistence on Bellona Island (Mungiki)", Sofus Christiansen (1975) raises several issues of central importance to cultural ecology and to the understanding of the structure of subsistence dependent societies, including their settlement patterns. The most elaborated question, which is also the main theme of the book, relates to the status of subsistence production, where he deliberately uses the concept of "syndrome" as an analytical approach, enabling a basis for survey and a necessary clarification of elements and their connections, but also a means for diagnosticating the bottle-necks in the production (p. 28). But even though his approach is towards the inner dynamics of a steady-state system, he cannot resist looking into changes in status of subsistence imposed by the introduction of external relations. In that connection he is accentuating that money and subsistence are not to be seen as competitors, but as supporting each other (p. 108), even changes in the social and institutional connections due to the introduction of these relations are emphasized. An important conclusion in the book has to do with the concept of subsistence, as he stresses the fact that there is no existing typology of subsistence systems which seems to be completely satisfactory when focusing on changes (p 161).

Today, nearly 25 years after the questions were originally raised, they still seem to be central issues in relation to development of resource-based communities. And they are definitely cardinal questions in connection with the present development in the Arctic. The intentions of this paper are to give an introduction to the general situation of Arctic settlements, and to show how the questions of informal economy and subsistence are crucial in the Arctic discourse by means of examples from Arctic North America and Greenland. The focus of the analysis is on the interrelation between the formal sector and the subsistence sector, how the two sectors coexist, how transfer incomes are becoming equally important as the wage incomes, and with an informal economy as an intermediate actor creating a linkage between the different sectors. This adds new dimensions to the understanding of the role and importance of subsistence production.

## Settlement structure in the Arctic

The peoples of the Arctic - or probably more correctly formulated: the resources of the Arctic - have been in the interest sphere of Euro-American colonialism and capitalism for centuries, causing many similarities in the development of the settlement patterns. Among the major similarities are the monopolistic conditions characterizing the relationships, for instance with the Royal Greenland Trading Company (Kongelige Grønlandske Handel) in Greenland, the Hudson's Bay Company in Canada, and the Russian-American Company in Alaska. Yet also significant dif-

ferences have been shaping their present development. Among the major differences are the specific historic conditions for the development of the monopolies, as well as the general conditions for the development of capitalism. Especially the abandoning of the monopolistic conditions differs, because the role of the state has been very different. Without going in details, and by using very broad categories, one could characterize the conditions as state capitalism in Greenland, state interventionism in Canada and state subventionism in Alaska (Rasmussen, 1997a).

The result has been settlement patterns which can be described as a conglomerate of a conscious and rather similar settlement policy, a very different commercial and industrial policy, and of course also heavily influenced by the settlement pattern which has been the result of the traditional use of renewable resources. The traditional resource usage required a dispersed and flexible settlement structure, but through the process of modernization and industrialization it became necessary to create infrastructure and labour markets, just when the social institutions, which were required for the reproduction of the labour force, became necessary. Above all, it created a requirement for a much more centralized instead of the traditionally dispersed structures.

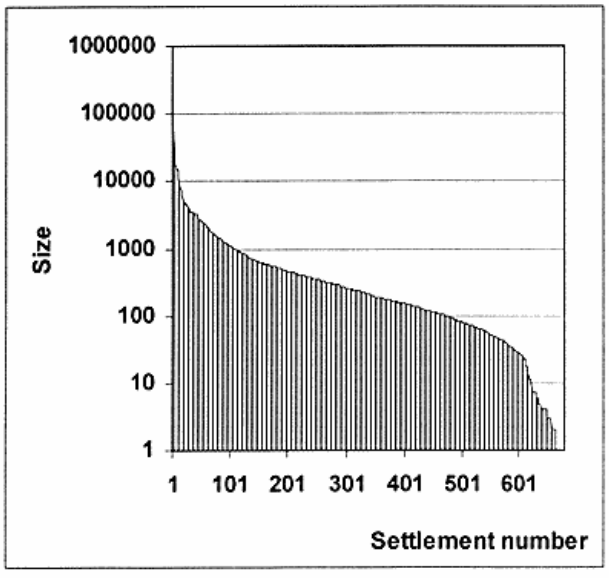


***Figure 1:*** *Size distribution of 673 settlements in Arctic North America (1991-1996-data from Alaska, Canada, Greenland and Iceland). Five characteristic groups are discernable: A few cities (>15000 inh.), the regional centres (above 4000 inh.), two intermediate groups (800-1500 and 1500 to 4000 inh.) and the small settlements (below 800 inh.). The curve is only valid in relation to settlements larger than approximately 15 inh. Due to differences in definition and registration. (Source: Rasmussen, 1996b).*

During the '50s and '60s only limited resistance against the centralization tendencies was articulated, or the resistance was suppressed by the governing bodies. But with the growing consciousness about traditions, especially connected to the strives for self determination during the 70's, another perception of what could be an optimal settlement structure evolved. In the case of Greenland, the traditional settlement pattern was directly accentuated through Home Rule policy, emphasizing that "bygderne" - the villages - should be the backbone of the settlement policy. But even the official policy was stressing the importance of a continuous existence of the small settlements, a concentration process has been continuing, with growing population in the large settlements and a decline of the share of the population living in the small settlements.

Focusing on the status of settlement size in the Arctic (figure 1) there seems to be several distinct size levels, including a number of large settlements above 15000 inhabitants, the regional centres above 4000 inhabitants, a relatively large number of intermediate settlements in the size group between 1500 and 6000 inhabitants, another intermediate settlement size group between 900 and 1500 inhabitants. The majority of the settlements, however, are below 900 inhabitants and down to approximately 15 inhabitants where there is a marked break. This break is not reflecting a change in the settlement pattern, but is primary due to the character of the statistics where individual houses and very small clusterings only seldom are registered as settlements, but instead registered collectively as "unincorporated" or "dispersed houses and farmsteads". Consequently, a fairly large number of these very dispersed settlements are not covered by the statistics.

For most of the Arctic, the majority of the population is living in large settlements - "byer" or towns. Half of the population in Arctic North America - Alaska, Canada, Greenland and Iceland - are living in settlements larger than 25000, even this size group only covers around 1% of the total number of settlements. In the other extreme more than half of the settlements have less than 250 inhabitants, but only covering round 4% of the population. This pattern - a few large settlements and then a large number of small places clustering around the large places - is a general characteristic of the settlement structure. Most small settlements are placed in relation to a land-sea continuum and primary based on the high productive parts of the sea where resources for fisheries and hunting of sea mammals are abundant. Another characteristic group in the Arctic settlement structure is the medium-large scale settlements dominated by administrative and educational activities.

These settlements, typically between 1000 and 5000 inhabitants, have a relatively stable economy based on transfers. They more or less constitutes a kind of "backbone" in the Arctic settlement structure, rather evenly distributed across Canada and Alaska just as they are dominating the Open Water district (the West-central coast) of Greenland.

Even if the many efforts - deliberately as well as more accidentally - for several decades caused a marked reduction of the small settlements, the absolute decline of the population in the small settlements seems to have stopped during the 80's (see figure 2a). This may partly be seen as a consequence of official policies which have emphasized the importance of the small settlements as a bearer of cultural traditions, and therefore urged young people to return to the settlements after finishing their education. More material incentives in Greenland, such as the attempts to de-centralize activities such as vocational training, and by retaining the principle of equal-prices (that the price of specific commodities should be the same no matter in which settlement they are bought), have certainly contributed to this process as well. But these explanations are partly contradicted by a number of equally important characteristics of the processes which have taken place during the 80's. An increase in the number of jobs offered has most often taken place in the large settlements. And exactly in this area skills acquired through the educational and vocational training system are wanted, just as the general living conditions measured by means of income and social services have been increasing most importantly. So there are other reasons for the stagnation and decline in the number of small settlements.

Looking into more details in the development during the last 30 years in Greenland (figure 2b), it is clear how the large settlements have been growing, while the small have declined in size. The dividing size group is the settlements with around 400 inhabitants which has been rather constant during the period of time in scrutiny, while all size groups above this have been increasing in size, and all size groups below have been decreasing. But there are important variations in most size groups (Rasmussen 1998a). Among the large settlements (above 1000 inhabitants) most of the settlements have been increasing, but there are a few which have been constant during the 30 year period, and even some with a small decrease in size. In the middle group (from 100 to 1000 inhabitants) there is no clear pattern, but more or less the same number of settlements which

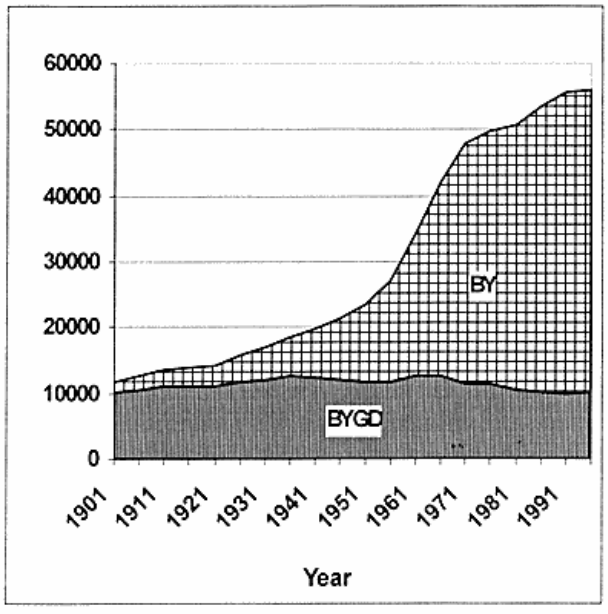


*Figure 2a: Share of population in "bygder" (villages and dispersed farmsteads) and "byer" (towns, municipality centres) in Greenland since 1901. It is obvious how the dispersed "bygder" have been the backbone of the settlement structure during the last century, with a relatively constant population of between 10 and 12000 inhabitants, while the market growth in population has settled in the municipality centres. (Source: Rasmussen, 1996b).*

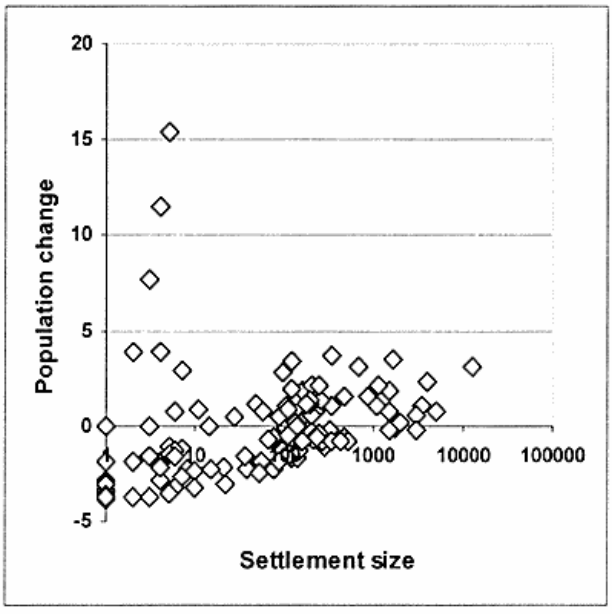


*Figure 2b: Change in settlement size in Greenland from 1970 to 1996. Each spot shows a settlement based on its present size, and the changes which have taken place during the 26 year time-span. A general trend is the increase in size of the large settlements and a decrease in size of the small settlements. The turning poing seems to be around 400 inhabitants. A few very small settlements have increased considerably in size due to the development of commercial sheep farming during the 1980s. (Source: Rasmussen, 1996b).*

have been increasing and which have been decreasing respectively, even the average increase is larger than the average decrease. In the group of small settlements (below 100 inhabitants) the pattern is extremely dispersed, but a number of characteristics should be noticed. First that very small settlements seems to be disappearing. These settlements are typically dispersed sheep farms, where the inhabitants either have given up their farmstead, or have moved to the sheep farming communities established by the Home Rule during the 80's. The marked increase in settlements from 5 to 10 inhabitants is due to this organized settlement development. The majority of the small settlements, which have experienced a decline in population of 2½ percent or more during the 30 year period, are the small hunting communities in the North and East, and the small fishing communities in the South, where the ban on the sealskin and the disappearance of the cod seem to have struck most severely.

## Formal, informal and subsistence economy in the Arctic

As shown, the change in settlement structure is not so unilinear as it is often thought to be. The general perception is a process with a marked increase in the large settlements, and a decrease in population as well as in the number of small settlements. An important part of the explanation is to be found in the fact that the local economies are not determined by the one dimensional capital/wage earner rationality prescribing concentration and centralisation, but very much influenced by other rationalities, as already described by Chayanov around the turn of the century (Chanyanov 1966). These rationalities are to some degree reflected through other economic categories.

There are four major economic categories which could be considered determining - or at least influencing - the conditions for development in the Arctic. On one hand there is the dominating formal economy, due to the fact that the Arctic is not only included, but an integral part of the capitalism of the northern hemisphere, where wage earning has become the major source of income for the majority of the population. Just as in many other parts of the developed world, however, income transfers also seem to be an enduring part of the formal economy in the Arctic. And here - as in the rest of the world - it is difficult to draw the exact line between income transfers and other activities in the service sector. On the other hand, many economic transactions are taking place outside the formalized economy. Local market sales of products and local rendering of services are important in the Arctic, and in contrary to more southern places, such activities are often encouraged and facilitated through public services. In Greenland most municipality authorities are taking care of the establishing and maintenance of a market place open for non-registered sale of products from local hunters and fishermen. And last, but not least, subsistence is still playing a crucial role for the survival in the Arctic. Particularly in small settlements, but generally in all types of settlements in the Arctic. This is probably one of the major differences to more southerly parts of the northern hemisphere.

## The formal sector

Though barter economic relations were common during the first centuries of interaction between Northerners and Southerners, the introduction of the money economy really got its foothold during the latter part of the 20th century (Marquardt and Caulfield 1995). Especially the economic changes which have taken place after World War II are parallell to the patterns in the more southern areas in relation to the structures of the formal economies. Even though the Arctic is perceived as being a region dominated by renewable resources and large scale non-renewable industries, the present formal economic structure is totally dominated by the tertiary sector, i.e. a different kind of services which Robinson and Ghostkeeper (1987) refer to by the concept of the "Next Economy" emphasizing the information and service industries as key elements.

Figure 3a-c give a picture of the formal economic activities in Arctic North America according to the traditional division between primary, secondary, and tertiary activities. The total income for all inhabitants in each settlement has been registered and classified according to the definition of primary, secondary and tertiary activities respectively. It is obvious how the general importance of tertiary activities such as public and private services, education, administration and bureaucracy turns out to be the most dominating occupations all over the Arctic, and in all size classes. In this respect the Arctic bears clear resemblance to the rest of the developed world! Only in a very few cases the tertiary sector covers less than 50% of the economic activities, while the average value is much closer to 90%, and in several settlements this is the only registrated formal economic activity. The traditional primary activities such as fishing, hunting, mining and agriculture show a more dispersed pattern, even it still could be said to be

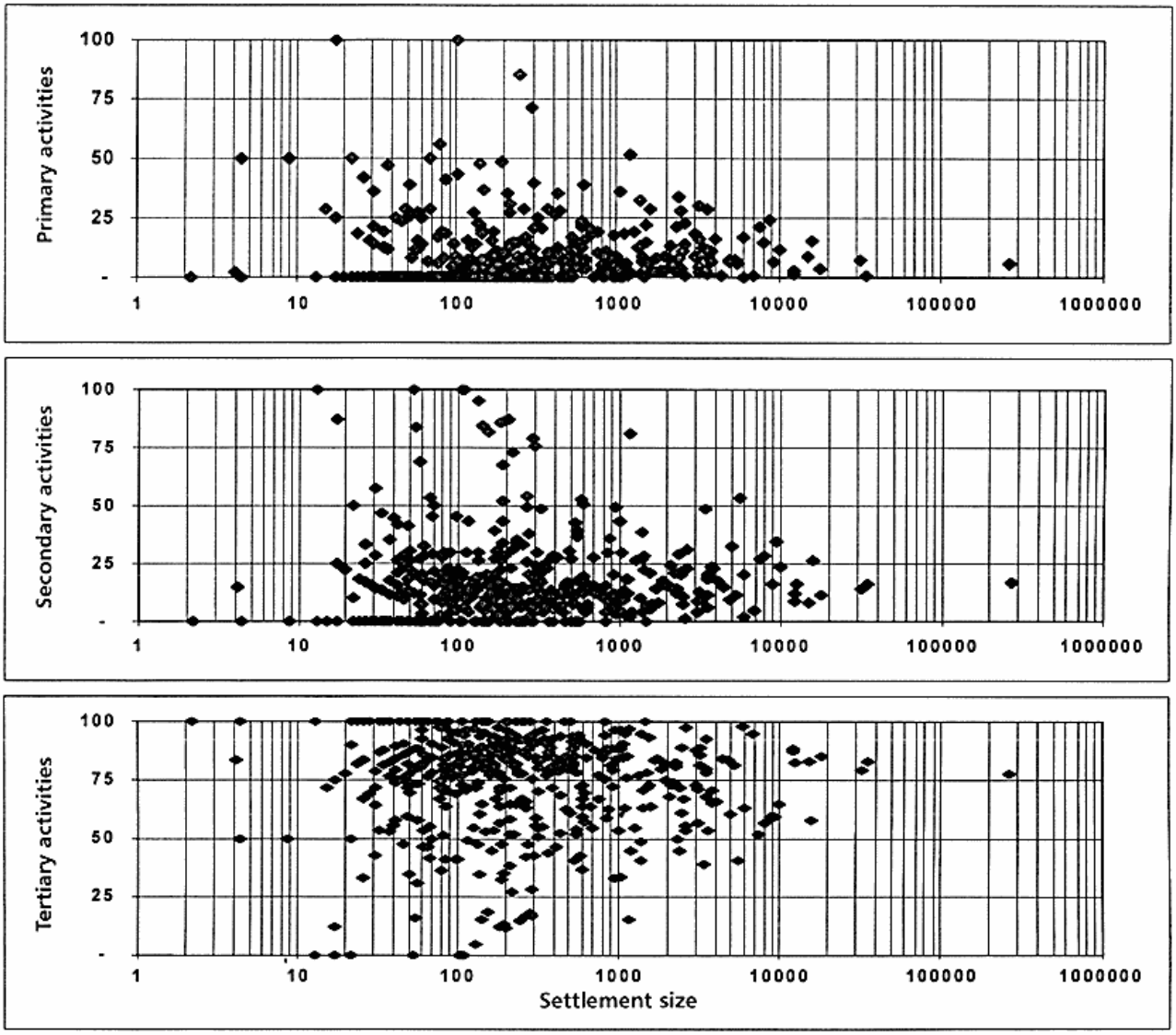


***Figure 3:*** *Relationship between settlement size in Arctic North America (Alaska, Canada, Greenland and Iceland) and the distribution of incomes in the three groups: primary (top), secondary (middle) and tertiary (bottom). The dominance of the tertiary sector is very clear. (Source: Rasmussen, 1996b).*

characteristic for the Arctic that the traditional way of life is still economically important in the small settlements. It is especially among the small settlements that a relatively large number are highly influenced by primary activities, but there are only very few cases where the economic outcome contributes with more than 30% of the total formal economy. There seems to be a clear tendency towards a reverse proportionality, so that an increase in importance of primary activities with a decrease in size is found. The secondary activities include the manufacturing of non-durable goods based on primary raw materials such as fish and fish products, but also in a few cases the manufacturing of durable goods. These activities are more or less limited to western Greenland and coastal Alaska, and generally found among mid-size settlements. But the pattern in many ways resembles the primary activities, only with a less marked reverse proportionality, and with a larger number of settlements with 30% and more secondary activities.

The general income level in the Arctic is relatively high, with the largest incomes typically in the largest settlements. Consequently, some of the tendencies towards a higher degree of incomes from primary and secondary ac-

tivities in the small settlements may very well be related to a lower income level in these settlements, so that the real value of incomes from fisheries and manufacturing may be higher in the large settlements, but proportionally lower compared with the incomes from the tertiary sector. Even though there are marked difference in the welfare model used in different parts of the Arctic, the region as such is very much influenced by income transfers. The main difference shows in relation to the sources of the income transfers, as Greenland - and partwise Canada - are influenced by the Scandinavian welfare model with transfers based on high taxes and public involvement, while transfers in Alaska are basically based on private sources and public revenues from the oil industry. As there is no general analysis of the character of income transfers in the Arctic, the case of Greenland shown on figure 4 may illustrate some of the general tendencies.

The absolute value of income transfers per capita is almost at the same level, independent of settlement size. But there are marked differences in the types of transfers, depending on the settlement. In the large settlements the transfers are primary characterized by unproductive social arrangements such as social security, unemployment payment, kindergartens, old age homes etc., while in the small settlements the transfers are usually connected to economic activities through commercial support, subsidies, etc. Another considerable difference is the level of importance. The absolute value of income transfers in Greenland is more or less at the same level in the small as well as in large settlements. But due to much lower average incomes in the small settlements, the transfer payments seem to be of greater absolute importance here. Typically more than 1/4 of the average income in the small settlements stems from transfers, while the higher incomes in the large settlements cause a situation where only 1/8 of the total incomes come from transfers (Rasmussen, 1997b). Besides the differences in the settlement sizes, there are also great regional differences in income transfers. These, however, resemble the differences described above, so that the more densely populated regions tend to be dominated by unproductive social transfers, while the more remote areas are dominated by transfers closely related to the production sphere.

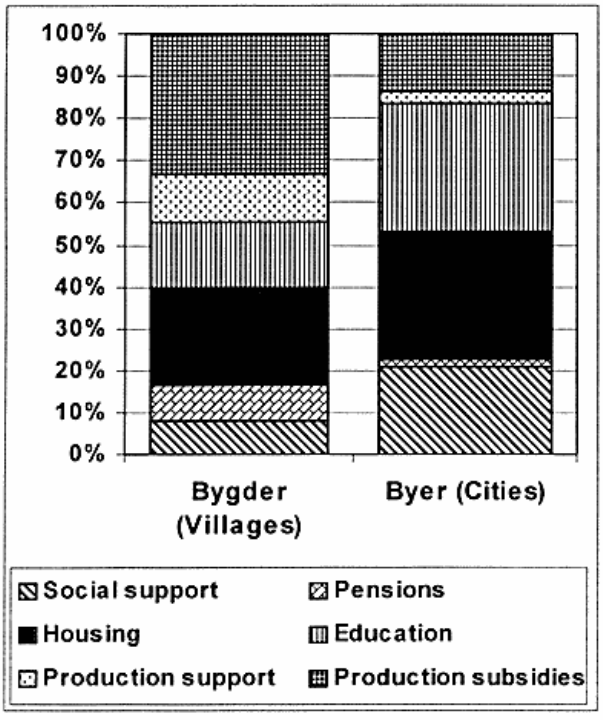


*Figure 4: Income transfers in Greenland. Relationship between settlement size and transfer type. There is a marked difference between the cities in relation to types of transfers. More than 60% of the transfers to the villages are "productive" (production and education), while more than 50% of the transfers to the cities are "unproductive" social services. Data from 1987-1991 (Source: Friis and Rasmussen 1996, Rasmussen 1997b).*

## The informal and subsistence sector

None of these figures related to the formal and transfer economy reveal, however, the real importance of the different activities. They neither show the cultural importance of doing specific jobs, nor the real economic importance of the activities. But as mentioned above, and generally discussed in relation to the Arctic by Caulfield (1992), Duhaime (1991), Kruse (1991) and Dahl (1989), the informal and subsistence sectors are considered to be crucial for the survival of the small communities. An analysis of the subsistence activities is often part of the traditional anthropological and cultural ecological analysis, with either focus on material outcome of the activities (Wolfe and Walker 1987 ), time spent on the different activities and the energetic balance (Scientific America, 1971) social and cultural importance (Condon, Collings and Wenzel 1994), and still others focusing on the relationship between several of the elements just as Christiansen does in 1979, emphasizing the relation of the - social and culturally defined - rationality between time consumption and energy output.

Wolfe and Walker (1987) show how harvesting of fish, land mammals, marine mammals, and other wild resources occurs in Alaskan communities at substantially different

levels, but also that subsistence harvests are making considerable contributions to the welfare of many rural Alaskan communities. Kruse (1991) discusses how the subsistence activities actually have increased in the North Slope Borough during the last decades. For NWT, Canada, Green and Green (1987) stress how country food is only sold in a few northern communities, and that most non-natives - which are 42% of the northern residents - rely exclusively on imported foods, and that natives are changing their dietary habits and use of a large variety of southern foods in their diets. Usher and Wenzel (1987), however, give an overview of studies conducted in Canada, describing and analysing the hunting and trapping economies of native Northerners, and clearly show the extent of the importance of subsistence. And as Berkes (1990) remarks, subsistence fisheries have been virtually ignored for a long time partly because there has been little published material regarding their extent and significance. He adds that analysis clearly shows that this type of activity is not an incidental cultural remnant from the past, but a critical economic activity. Besides, Marquardt and Caulfield (1995) clearly demonstrate not only the local importance of subsistence activities in Greenland, but also how the discourse in Greenland has included subsistence and informal marketing as important development factors. They discuss how the local markets - the Kalaaliminerniarfik - arose in the 18th century to meet the needs of the employees of the church, the KGH (Royal Greenland Trade Company) and its predecessors. The local markets served as a "leveller" of differences between Greenlandic hunters and their countrymen working for the colonial authorities, as a redistribution channel whereby hunters received European goods, while Greenlandic and Danish salaried employees received valued country foods and locally produced items of clothing and other goods. Without the local market, a more stark separation might have developed between the subsistence and the commercial activities. The markets have remained since then, so that most of the major towns are represented and with nearly all types of country food exchanged.

What they stress is the fact that an important part of the problem in the Arctic is not only to compare the formal and the subsistence sector, but also to take into account the informal sector. The informal sector, or the informal economy, is in this connection defined as the part of subsistence activity which is sold (or exchanged) either on a local market or between people, but not registered by the formal authorities such as the taxation-authorities. It is somewhere in between subsistence, i.e. hunting and fishing for own or family survival, and formal economy where products from hunting and fishing are sold to registered and registrating authorities. The informal sector, therefore, creates a kind of linkage between the two sectors. This is exactly what is emphasized when Usher (1986) points out the complexity of the relationship between domestic/subsistence and commercial production, and when Dahl (1989) shows how the distinctions between subsistence and cash-based economic sectors are more or less artificial and meaningless, as the two sectors are thoroughly interwound.

A major problem is to get more general information about the subsistence activities in the Arctic. Usher and Wenzel (1987) made an effort to bridge the purely economic and the purely biological approaches to the question of harvest statistics. With most of the studies relying primarily on participant observation made possible by extended field residence, but also obtained harvest and/or diet data through recall surveys. They list some main sources to native harvest activities and discuss the potentials and limitations of these sources. Their list includes: administrative records, administrative commercial and sport harvest record, scholarly social science studies, government planning studies, socio-economic impact assessments and claims statements, nutrition studies, and biological and wildlife management studies. In general, however, none of these sources are comprehensive, and a fundamental problem is to make records from the different sources comparable. What should be kept in mind in any case is the fact that it is difficult to measure the cultural importance of specific activities by economic measures!

A major question in the Arctic in general is the transformation of the outcome of subsistence hunting and fishing into economic values. It raises the questions of which values should be assigned to the products. The approach to the analysis differs, but is dominated either by registration of frequency of consumption of country food such as Statistics Greenland (1993), or registration of volume, for instance Berkes (1990) and Wolfe and Walker (1987). A more general approach would be to assign economic values to the informal and subsistence activities, but a central problem is how to convert volume or frequency to value. What would be a suitable conversion factor? One approach would be to choose the replacement value, i.e. what the price would be if the same volume of products should have been bought in the shop. Another would be to choose the commercial sale price, i.e. what the price would be if the quantity should have been sold to a local producer.

Roots (1981) emphasizes that the accounting in an appropriate manner for the success or failure of northern resource

management is difficult because the base of value is constantly changing. Just as inflation can nullify expected benefits in dollar terms, or make nonsense out of carefully laid financial plans, so can changing values profoundly alter the net worth of resources or the benefits to society from their management.

But it is probably more easy to create an objective exchange scale in Greenland than in most other places in the Arctic, as the informal sector and the existence of local markets with a price setting, which is very close to prices in the official shop prices, seem to indicate that the open market price is very close to the real value of the products. Hunters and fishers today have at least four possibilities of marketing country foods: to sell them privately within a community, to local institutions, at the local market or to the processing plants. Only by sale to the processing plant the price level is considerably lower than in the three other situations. So in the case of Greenland, therefore, the conversion is rather easy. And this is the rationale behind figure 5 (based on Rasmussen, 1997a). The data come from an inquiry made among members of KNAPK - the Small Scale Fishermen's Organization - in 1995/1996 (Rasmussen 1996b). The figures give a clear indication of the difference of importance of the various activities, depending on the settlement size.

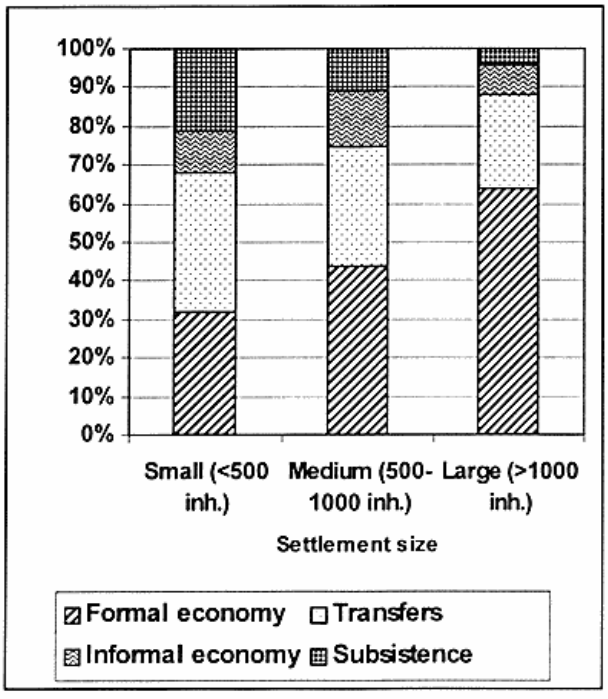


*Figure 5: Formal, informal and subsistence economy in Greenland. Percentage of average household income generated through wages and formal sale of local products, income transfers, informal sale of products at the local market or between individuals, and economic value of subsistence activities (Source: Rasmussen 1996b and 1997a).*

The formal economy, i.e. wage incomes and incomes in connection with sale of hunting and fishing products to registered producers, clearly dominates the large settlements, but plays an important role also for the small settlements. Of equal importance in the small settlements are the transfers which in absolute values are of the same size in the large settlements. However, due to generally higher incomes, they play a more limited role. The informal economic activities are important in all settlement types, but most markedly in the mid-sized settlements. This is partly due to the fact that many hunters and fishermen from medium sized settlements are bringing their products to the markets in the large towns where the number of customers is larger. The subsistence sector is present at all levels, but most dominating in the small settlements, where 1/5 of the total economy seems to come from subsistence hunting and fishing, while subsistence contributes with 1/10 of the household income in the large settlements and approximately 1/20 of the incomes from the large settlements. Important to keep in mind is the fact that there are marked differences in income level between the settlement sizes. The average income in the large settlements is more than double the income in the small settlements, so in absolute terms the difference is much more limited than the figures seem to indicate.

A general pattern for all settlement types is that the informal and subsistence sector seem to be of importance, with 1/8 of the incomes in the large settlements, 1/4 in the medium sized, and 1/3 of the incomes in the small settlements stems from outside the formal economic activities. This pattern is compliant with the observations of Wolfe and Walker (1987), who show how the combination of subsistence and commercial-wage activities provides the economic basis for the way of life so highly valued in rural communities. In rural communities there is a great desire to maintain this part of a region's economy in the face of new economic changes primarily developing from the urban population centres. Also Marquardt and Caulfield (1996) stress the importance of the local markets serving as a leveller of differences between hunters, fishermen and wage earners, and as a redistribution channel distributing European goods for valued country foods and locally produced items of clothing and other goods. But it has also served as a lever for bringing country food into the retail sale in the shops. As in the rest of Arctic North-America, the trade monopolies tended to serve as a carrier for more

southern food habits, and bring along alien products such as pork, beef, and especially poultry. This process partly succeeded in Canada, and for decades it also seemed to be the case in the large settlements in Greenland as well. But due to the availability of country food at the local market, and thereby the maintenance of a continuing demand, the products were introduced in the shops during the 80's, and are today considered stable basic food in all types of settlements (Rasmussen 1998b). However, besides the lever function in relation to the formal market economy, there is no doubt that the subsistence sector has been a crucial element in the resilience and continuous existence of the small-scale settlement, "bygder", in Greenland - a pattern which seems to continue in the future in Greenland, and in the Arctic in general.

## Perspectives

The settlement structure is a materialized image of an optimization process involving three characteristics: the natural potentials of society, technological and technical skills, and institutional and organizational structures of society. Its resource base is transmitted or manifested through society's understanding of what is to be considered as a resource, but also realised as potentials, based on the technological and technical skills of society (Rasmussen, 1996a). The institutional and organizational structures are on one hand required as a mediator of the relationship between the natural potentials and the technological and technical skills, but at the same time part of distinct dynamics between the individuals and their social organisation of activities. There is no doubt that the present settlement structure represents marked differences in goals, in measures, and in means for people living in the Arctic. But it is also clear that the informal economy and the subsistence sector are playing a crucial part in the development process. In this sense there seems to be an even increasing need for the development of a typology in relation to the rationality of the (subsistence) production, as emphasized by Christiansen in 1975. Especially because the informal and subsistence sector are not only to be considered as "syndromes", but to be central dynamics, and therefore important players in the settlement game in the Arctic so far, and probably in the future as well.

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southern food habits, and bring along alien products such as pork, beef, and especially poultry. This process partly succeeded in Canada, and for decades it also seemed to be the case in the large settlements in Greenland as well. But due to the availability of country food at the local market, and thereby the maintenance of a continuing demand, the products were introduced in the shops during the 80's, and are today considered stable basic food in all types of settlements (Rasmussen 1998b). However, besides the lever function in relation to the formal market economy, there is no doubt that the subsistence sector has been a crucial element in the resilience and continuous existence of the small-scale settlement, "bygder", in Greenland - a pattern which seems to continue in the future in Greenland, and in the Arctic in general.

## Perspectives

The settlement structure is a materialized image of an optimization process involving three characteristics: the natural potentials of society, technological and technical skills, and institutional and organizational structures of society. Its resource base is transmitted or manifested through society's understanding of what is to be considered as a resource, but also realised as potentials, based on the technological and technical skills of society (Rasmussen, 1996a). The institutional and organizational structures are on one hand required as a mediator of the relationship between the natural potentials and the technological and technical skills, but at the same time part of distinct dynamics between the individuals and their social organisation of activities. There is no doubt that the present settlement structure represents marked differences in goals, in measures, and in means for people living in the Arctic. But it is also clear that the informal economy and the subsistence sector are playing a crucial part in the development process. In this sense there seems to be an even increasing need for the development of a typology in relation to the rationality of the (subsistence) production, as emphasized by Christiansen in 1975. Especially because the informal and subsistence sector are not only to be considered as "syndromes", but to be central dynamics, and therefore important players in the settlement game in the Arctic so far, and probably in the future as well.

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