# Resource Revenue Regimes around the Circumpolar North: A Gap Analysis

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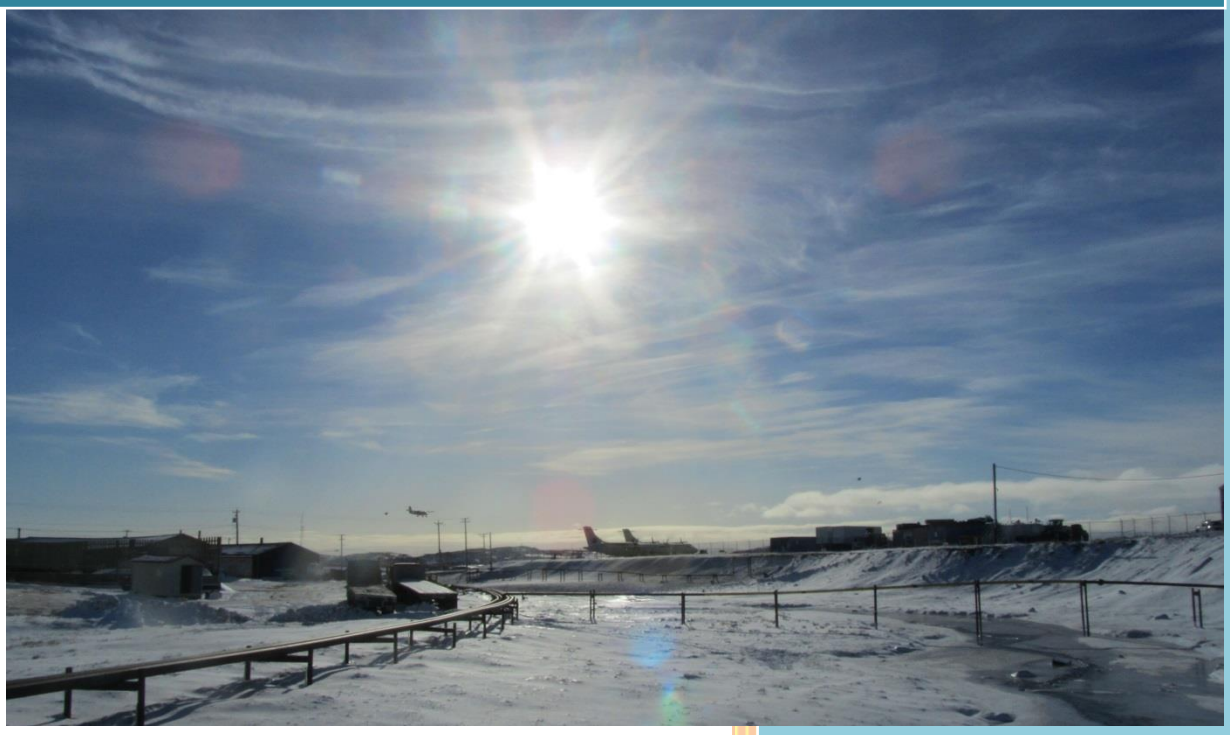

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ReSDA RESOURCES and SUSTAINABLE DEVELOPMENT in the ARCTIC

## Introduction

The international press has heralded the new age of arctic resource development. Arctic nations are optimistic about the prospects for resource development in the north. New resource projects are being discussed in areas of current production, like Alaska and Russia, as well as new regions, like Nunavut and Greenland (Rasmussen, 2011).While there are reasons to be cautious about this optimism, changing world demand for resources and changing conditions brought on by climate change may open up the long recognized Arctic resource storehouse. For some regions of the north resource development will introduce a new experience. For regions with a history of development, their experience presents a mixed history of success.

The governments of arctic nations and major resource producers may view potential resource development positively in terms of additional jobs, revenues and profits. Residents of northern regions are likely to have more mixed feelings. Past experience with booms and busts, limited local employment or investment opportunities, and locally suffered costs may make residents wary of resource development opportunities. At the same time, limited economic opportunities mean northern residents may be searching for ways to insure that development of the regions resources results in prosperity and they are not simply left with "a hole in the ground" after the resource is removed. In particular they are looking for ways to ensure that a larger share of revenues remains in the region to build "linkages" that can be used to bring about a more sustainable economic future.

This chapter deals with the question of resource revenues. We present a survey of the literature on resource revenue regimes and the way they impact regions such as the north. The revenue that local communities receive from resource production is one way the prosperity associated with development can be shared with local residents. When these revenues are saved they provide a means of sustaining that prosperity beyond the end of resource production (Irlbacher-Fox & Mills, 2007). We are looking for gaps in the existing knowledge which will help to define ReSDA's research agenda going forward.

The next section discusses the economic relationship between regions and resource development. This is followed by a general discussion of the resource regimes across the circumpolar north. Based on the existing literature, the remainder of the paper asks six questions that can be used to guide research on finding ways to ensure a more sustainable future for these regions. Each question defines a key element for building an understanding of resource revenue regimes in the north.

**Resources and the Northern Economy**

Resource production is an important part of the economies of the Circumpolar North. The economic base of the North's local and regional economies consists of three sectors; the international resource sector, the traditional or subsistence sector and the public sector. Each of these provides real income for residents of the North. Local resources are the basis for the traditional economy which produces for local consumption throughout much of the region. Resources are also a major part of the Circumpolar North's exports to the rest of the world. While the public sector in the north is primarily supported by transfers from higher levels of government, resource revenues may also provide funds to support the region's third key economic sector (Huskey, 2010).

The North's predicament is that while the cost of resource development is concentrated in the north, the regional benefits of natural resource production are limited. The benefits of resource development for a northern region will depend on the portion of the resource rents and production costs that stay in the region. Unfortunately, the technical nature of most resource production for export means that most of the income earned by resource production flows to non-Northern owners of the capital and technical know-how and skilled labor. These inputs are brought from outside the region. The large scale of many resource projects often means that even unskilled workers are brought into the region since the sparsely settled northern regions can't supply enough labor. The concentrated nature of natural resources and the enclave structure of production also limit the connection with communities. The structure of production means there are few linkages between resource production and the communities of the north. Most of the potential benefits flow from northern regions.

These observations are not new. There is an increasing realization among socio-economic researchers that extractive industries production is often problematic for producing countries, regions, and communities. Building on earlier Canadian staples theory, researchers have shown that, despite an intuitive belief that natural resource development will increase the wealth, and therefore the well-being of producing regions, a resource curse exist. The paradox of the resource curse is that extractive resource development often leads to a decrease in development possibilities in these regions and produces other problems (Humphreys, Sachs, and Stiglitz, 2007; Collier, 2008; Ploeg, 2011).

Even before the debate over the resource curse started, researchers were pointing out problems that came with resource development in regions with large indigenous populations (Nash, 1979; Watkins, 1977). Research in North America was pointing out that, at least since the 1930s, rural areas had generally had poor economic growth if the main activity was based around resource extraction industries (Freudenburg, 1992; Freudenburg & Wilson, 2002).

Yet the findings of the resource curse researchers came as a surprise to many because it seemed "counter-intuitive" (Larsen, 2005). How can the development of something that brings such wealth be a curse instead of a blessing? Indeed, while it was relatively easy to use cross-national econometric analysis to show that a resource curse existed, it was more difficult to explain it or to decide whether the curse was an inevitable outcome of resource development. Over the past 15 years various means were used to try and determine the reasons why the resource development is a curse. A range of explanations exist such as resource production having a negative impact on education (Gylfason, 2001), and on the ability to save (Atkinson & Hamilton, 2003), and corruption (Pendergast, Clarke, & Van Kooten, 2011). One popular criticism of the inevitability of the resource curse summarized the arguments under five headings, the first three of which were: the negative impacts of currency overvaluation caused by the dominant commodity (the Dutch disease explanation), the fact that resource commodities are prone to declining terms of trade, and the volatility of commodity prices (Davis & Tilton, 2005). A forth explanation relates primarily to mining and the fact that it often has important negative impacts on a locality and yet offers few benefits. According to the authors "…local communities tend to

bear most of the environmental and other social costs associated with mining, while the benefits flow largely to the central government and elsewhere." (236).

The fifth explanation for the resource curse offered by the researchers is the most important for this paper: the use of resource rents. Here rent refer to those surplus returns that come from extraction and sale of resource commodities once the normal production costs and normal returns to capital are accounted for. One of the particularities of resource commodities is that they often produce these surplus returns, or superprofits. According to some researchers, these superprofits can cause many problems in a society. Once again referring to mining, the authors summarize the argument as follows.

> "The use of rents, it is widely recognized, is critical in determining whether or not mining promotes economic development. When they are squandered by corruption, war, and other rent-seeking activities, mining is likely to be a negative rather than positive force for development. The same is true when the rents are wastefully consumed — on luxury automobiles from abroad, for example — rather than invested in alternative forms of capital."(Davis & Tilton, 2005: 239)

Here the nature of resource rents is seen as being at least partially responsible for the resource curse by encouraging pathological "rent-seeking behaviour" such as corruption, crime, and violence. When resource rents flow to the region the argument is that they come under control of the ruling elite. This creates a range of problems in addition to inequalities between groups and internal regions.

> "…the presence of mining rents may lead to a decline in institutional quality (Ross, 2001b; Sala-i-Martin and Subramanian, 2003) and in some instances to civil insurrection and war (Collier and Hoeffler, 1998; Gylfason, 2001; Sachs and Warner, 1997a). Even when the rents are not squandered, but used by the government to promote economic development, the results are often disappointing due to incompetence and poor planning." (Davis & Tilton, 2005: 236)

Despite these problems, a consensus seems to have emerged in the resource curse literature that these issues are not inevitable. Especially as concerns resource rents, measures can be taken to avoid the worst types of rent-seeking behaviours (Humphreys, Sachs, & Stiglitz, 2007). Those countries and regions that have "good institutions" can be trusted to deal with superprofits in a manner that actually helps rather than hurts development.

While the resource curse discourse is of interest to Arctic communities looking at resource extraction as a potential means of development, many in these communities would find it strange to be told that one of the biggest dangers would be their ability to earn superprofits from these activities. Not that the notion of the potential misuse of funds due to corruption or inefficiencies would be foreign to them. It is simply the notion that they would get any of these superprofits at all. It seems strange that the resource curse researchers would devote so much attention to problems stemming from the local appropriation of profits from resource production and very little from problems stemming from the inability of local communities to appropriate any of these funds – a situation that has historically been far more common in the north (Watkins, 1977).

The resource curse discourse is interesting to understand how aspects of resource development, and especially the use of resource rents, can lead to economic problems. Being a discourse built around a discussion of nation-states, rather than regions, it is somewhat more limited in usefulness to a proper understanding of local and regional situations (Ali, 2009; Goldberg, Wibbels, & Mvukiyehe, 2008; James & Aadland, 2011). The overvaluation of a national currency, for example, is unlikely to be a major concern for Arctic communities trying to provide jobs to its unemployed youth. While providing some idea of what to avoid, the resource curse discourse itself does not provide an analytical framework to understand how communities in the north can use resource development, and the resource rents that accompany this type of development, to bring about a more sustainable future for these communities. Several of the researchers involved in the resource curse discussions do offer some help in this regard however. They note that resource development can lead to increased benefits when they produce linkages (Bridge, 2008; Kurtz & Brooks, 2011; Morris, Kaplinsky, & Kaplan, 2012). Explanations of the proper understanding of avoiding the resource curse seems to link back to an earlier economic discussion around staples theory. Indeed Richard Auty, the economist who first coined the term "resource curse", has used staples theory as an important analytical component of his research, including a discussion of a "staples trap" (Auty, 2007).

Staples theory, also called the staples approach or the staples thesis, is an analytical framework that grew out of the work of Canadian historians Harold Innis and W.A. MacIntosh. It was

initially a conceptual framework to describe how Canada developed through its role as the producer of staples, or basic commodities, and how these commodities impacted the development of the country. It became a means of describing how countries could develop economically based on staples production when the Canadian economist Mel Watkins borrowed A.O. Hirshman's concepts of backward, forward, and final demand linkages to show how these linkages could encourage the spreading of benefits into other sectors of the economy (Watkins, 1963). Problems with the original conceptualization of linkages led Hirschman to introduce a forth type – fiscal linkages (Hirschman, 1977).

The use of these four types of linkages as a conceptual framework allows researchers to understand how the development of a resource commodity can assist a community or region to diversify into a sustainable economy, or how it can provoke economic decline and produce a "staples trap" (Watkins, 2007). If production-related inputs are sought and developed locally, this produces additional economic growth through backward linkages. If the commodities are used to develop new products then the benefits of value-added would produce economic development through forward linkages. If the local wages and earnings are spent locally on demand-related products then economic growth is enhanced through final demand linkages. Finally if the resource rents are captured and reinvested locally, new economic growth would result from these fiscal linkages. If these linkage opportunities did not exist then linkage benefits would become leakages. The linkage benefits would go to assist economic development in other regions and communities and economic growth through diversification would not occur. Under this situation the community or region would remain in a staples trap.

Staples theory has been used to show how many regions of the United States were able to start with a resource base and grow into a diversified economy – especially during the 19$^{th}$ century (Frickel & Freudenburg, 1996). Throughout the 20$^{th}$ century the historical conditions that promoted most backward, forward, and final demand linkages changed considerably so that these types of linkages become less likely to exist and these potential benefits are leaked out to other regions (Freudenburg & Gramling, 1998). This is exemplified by changes in transportation and communication which make local and regional economies less isolated and as such make local production less likely to occur.

Backward, forward, and final demand linkages can still occur. Potential new linkages are developed constantly that could result in new forms of economic sustainability, but these linkages are likely to be less important that the fourth and final type of linkage – fiscal linkages.

There is an increasing recognition that resource rents should be used to mitigate any negative impacts of resource production and to assist marginalized populations in resource regions to develop sustainable communities (Pegg, 2006; Segal, 2011). In the past northern and indigenous peoples had little or no access to resource rents as the ownership and control of the land rested with central governments and private industry who saw little need to share control of these rents (Watkins, 1977). Now, however, new comprehensive treaties and the devolution of political powers to northern regions means that northern communities have the ability to potentially access resource rents and use them to create more sustainable forms of development (Coates & Crowley, 2013; Einarsson, Nymand Larsen, Nilsson, & Young, 2004; Irlbacher-Fox & Mills, 2007). Fiscal linkages are possible if resource rents can be directed towards local development and leakages are minimized.

While there is an increased belief that, properly managed, extractive industries can actually contribute to sustainability, and that the paradox can be resolved, there is still a lack of a coordinated effort of researchers on how exactly to do this. How can resource extraction be best used to create successful societies? What are the best ways to avoid the staples trap/resource curse? How can resource extraction best contribute to the well-being of producing regions and communities? What institutions best ensure that producing regions and communities benefit from resource extraction?

While these are complex questions that require complex answers, in situations where the proper institutions exist, an important part of resolving the staples trap/resource curse is ensuring a significant enough share of resource revenues stay in the region. When resource revenues are saved these savings provide a means of smoothing the benefits from development. The timing of the use of resource revenues may limit the boom-bust nature of development.

**Resource Revenue Regime**

Resource revenue regimes describe the fiscal rules of the game for resource production. Fiscal rules are the complement of the rules and regulations that govern how resources may be produced (ICMM, 2009). Taxes, royalties, and rents paid by resource companies are components of resource revenue regimes for government organizations. Local government and indigenous organizations may also share in the income produced by resource production as owners through profits. Fiscal rules will vary not only across governments; they may also vary across types of resources.

The fiscal rules affect the amount of natural resource revenues a region receives in two ways which provide northern governments with a tradeoff. First, the rate and rules of a revenue regime will determine how much of the income earned from any given level of production will be claimed by the public sector. This is the direct effect. If the tax rate is ten percent for every $100 resource production earns $10 is kept by government.

The indirect effect of taxes or other fiscal mechanisms operates through their impact on firms' production decisions. In the past resource development in some parts of the north might have been undertaken for strategic or political reasons, but the profit motive guides most production today. The fiscal rules of northern development will affect the profit potential of northern resource development and this will influence production decisions. An increase in tax rates will positively affect revenues from a given level of production but will have a negative effect on revenues if it discourages production.

In the North most subsurface resource rights are in public hands, and public ownership of natural resources remains the norm. Revenue regimes will reflect the attitude of northern government to resource ownership. If governments act like private owners they would control production decisions and hire a private resource company to manage the production and distribution of the natural resources. In this case, the public revenue flows to government in the form of profits from resource production.

A more common model in North America is the sale by the government of the right to use and profit from the use of a natural resource in a particular location. Under these ownership scheme public revenues from royalties, lease payments and bonuses, rents may be set by law, through negotiation, or auction. Government may also tax resource producers. Taxes on production can be levied on units of output, income or profits. Property taxes are based on the value of capital used in resource production or the value of resources in the ground. The manner of taxation will affect the production decisions of resource firms, the government's share in market and geologic risk, and the timing of revenue flows.

The final determinant of the resource revenue regime in any part of the north is the center of control. The fiscal regime will probably depend more on where decisions are made than where the resources are located. Decisions about the resource use, revenues raised and the distribution of natural resource revenues may be decided at the local, provincial, or national level. There may even be a mix in the locality of decision making.

When higher levels of government control resource use and resource revenues in a region, the resource revenue regime for that region can be defined by that government's distribution policy. Local governments may receive impact funds as a type of compensation scheme for the cost borne in the region of production or they may receive funds distributed to all local governments in revenue sharing. It's likely that as the center of decision-making moves away from the resource location, more of the rents generated by production are lost to the region.

Throughout the north institutional changes have brought more control back to the regions affected by resource development. Land claims negotiations in Canada and the US placed the control of some of the North's natural resources in the hands of indigenous groups by granting subsurface rights of ownership and regulatory authority for some resource uses. Alaska, the North Slope Borough, and Greenland are examples of other types of institutional innovations that provide more fiscal control in the north.

Questions of control go along with questions of how the resource revenue regime is determined. Who decides or influences the decision on tax rates, types, attitude toward ownership, and the

locus of decision making? The resource producers' ability to influence the rates and rules of the resource revenue regime is a significant question. The resource curse argument suggests that poor institutional development is one reason resource rich regions are made poorer by natural resource development. While not all countries in the north are mature democracies, most are, so this resource curse argument seems misplaced when discussing the north. But even in mature democracies special interests can use the political process to influence the decisions at all levels of government. The farther from the region of impact the decision is made the more likely resource producers can use horse trading and other standard democratic tools to minimize the revenues that go to the region.

Resource revenues provide the possibility that a resource producing region can prevent the reverse that historically has sometimes followed resource booms. Resource revenues provide a means for compensating the local residents for the cost of resource production. If resource revenues can be saved they also provide a way to spread out the benefits of resource development beyond the life of the project. Of course, the decision to save resource revenues is the decision not to spend the revenues. How the local area decides to spend its resource revenues can be considered as part of the fiscal regime.

**How do resource revenue regimes vary across the circumpolar north?**

Considering the attention given to the concept of the resource curse over the past 20 years, it is surprising that very little attention is devoted to differing types of resource revenue regimes. While the earlier staples discourse, based on the notions of linkages and leakages, noted the importance of understanding regimes in order to find out whether revenue stays in a particular regions to provide linkages or whether it leaks out of the regions. The resource curse discourse, based primarily on national econometric analysis, seems to assume that a suitable amount of revenue exists in a region and that the reason for the curse is that it is not used correctly. Indeed, blame for the curse is more often than not laid at the feet of the "victims" – they do not have the right institutions, they are susceptible to corruption, they don't invest properly in education, and they use violence to get a piece of the revenue.

When looking at how resource revenue regimes vary across nations and across regions with the perspective of finding the way to maximize benefits to northern communities, the staples perspective seems a more worthwhile lens by which we consider regional and national variations. The notions of linkages and leakages allow us to more clearly see how communities can benefit from the revenue collected for natural resource extraction. Which regimes allow for the greatest linkages (or stickiness) and which result in creates leakages.

Revenues that can be used for local linkages can come from several sources. One traditional source is the profits gained by the company that extracts the resource. At one time companies were locally based and as a result profits were mostly spent locally – allowing for important forward, backward linkages, and final demand linkages. Now however, most resource companies are international in nature and owned by shareholders in many areas of the world (United Nations, 2007). The large investment capital requirements to build the necessary infrastructure to support northern resource development means that returns on investments would normally leave the region (Huskey & Morehouse, 1992).

Some new variations in this regard do exist however in that northern communities can become economic partners in resource ventures and as such share directly in the profits that are generated (as well as the losses). In Alaska, Native Development Corporations, created under the terms of the Alaska Native Claims Settlement Act, do invest in resource developments. Perhaps the most well-known example of this is the Red Dog Mine in Northwest Alaska where the NANA Regional Corporation negotiated a joint venture lease arrangement with the Teck Mining Company by which they become economic partners in the development and share in the profits (Haley & Fisher, 2012). In Canada, Indigenous organizations, represented by the Aboriginal Pipeline Group have partnered with international oil and gas companies to be a one third owner of the proposed Mackenzie Gas Pipeline in the Northwest Territories (Nuttall, 2008). As such, these organization hope to share directly in the profits created by resource projects.

While other revenues can come from things such as wages, increasingly fiscal linkages from resource rents are seen and the most immediate and likely source of benefits (Bridge, 1999).

Under this situation, finding out how to best obtain, manage, and distribute these rents is a priority for northern communities and governments.

> "…Since it is these fiscal linkages which are paramount, a central public policy objective is the design of institutions (such as stabilization funds) and mechanisms (taxation policy, regulations concerning trust fund management) which buffer the short-term distortions of mineral price volatility and which maximize the long-term gains from mineral revenues…" (Bridge, 1999: 45)

While there is little research on comparing resource revenue regimes across the North, general descriptions do exist, often in "grey literature" of who collects these resource rents, what mechanisms are used to collect these rents, and where these rents go (Taylor, Severson-Baker, & Winfield, 2004). These regimes often vary between those used for oil and gas development and those used for mining. Generally oil and gas regimes vary first by the contractual form used by the state for relations with the developing company.

There are many variations but the four main types are concession or license agreements, production-sharing agreements, joint venture agreements, and service agreements (Radon, 2007). In the north, oil and gas developments are primarily concession or license agreements where a government allows a company to explore, develop, and sell the resource in exchange for royalties which are generally based on production (Alaska Dept of Revenue, 2012). Concessions are usually obtained either through open bids or negotiations. Often agreements include up-front payments (a license fee or signing bonus) to the government, especially in the case of open bids. Governments retain these payments whether development occurs or not. As a result, concession agreements are usually low-risk for governments but could be high risk for companies (Radon, 2007: 100). The other types of contractual agreements are partnerships between governments and companies where governments allow companies to develop a resource in exchange for a share of production (production-sharing agreements) or as an actual business partner (joint venture agreements). Under service agreements governments hire companies to develop a resource in exchange for a set fee.

Resource regimes are often characterized by the fiscal tools used by governments to capture resource rents from resource production. These vary in a number of ways. Profit-based tools

capture a portion of any profit gained by the producing company while production-based tools take a certain amount based on the outputs of the project. Companies tend to prefer profit-based taxes since they are only taken when the project produced a profit while governments have a more secure guarantee of rents when production-based instruments are used. There is a fairly well developed discourse around the impacts of the various types of taxation on resource development (ICMM, 2009; Lund, 2009) the basics of which are summarized in the table below.

**Key Fiscal Instruments**

| Instrument | Advantages and Disadvantages |
|---|---|
| **Royalty** | A fixed fee per unit produced or a percentage of production or gross revenue. Royalties provide a minimum payment for resources used, produce stable and early revenue, and are relatively easy to administer. However, beyond modest levels they can distort investment and production decisions because they are insensitive to costs. They are regressive. |
| **Income based taxes** | Corporate income taxes are less distortionary since they are based on revenue less cost. Foreign investors appreciate the fact that they give rise to foreign tax credits. However, they are relatively more complex to administer. Revenue is also delayed: by how much depends on capital depreciation allowances, which are often made generous to attract investment (i.e., provide faster payback). |
| **Rent based taxes** | Pure rent-based taxes are neutral since payment is only required after the investor has earned its required rate of return. However, in practice rent is approximated (Appendix II). Those based on a measure of achieved return are most effective but are also the most difficult to administer. The balance of risks is skewed towards the government. |
| **State equity** | Enables the government to share in the upside and is often viewed to increase the sense of national involvement. However, "paid" equity requires the government to contribute to initial capital outlays, and often gives rise to conflicts of interest arising from the government's role as regulator. |
| **Export duties** | Not very common. Export duties are relatively easy to administer but they distort the decision of whether to sell crude oil domestically or abroad and are insensitive to costs. |
| **Import duties** | Provides revenue even before royalties due to the import needs during project development. To mitigate the negative impact on investors, full or partial exemptions are often provided. |
| **Other** | Other instruments include: signature and production bonuses; land rental payments; withholding taxes on interest, dividends, and services; and value added tax, if applicable |

Taken from Goldsworthy and Zahkarova, 2010: 7.

Mining regimes have been heavily influenced by globalization pressures over the past 25 years. A key study done by the World Bank noted that increasingly countries are harmonizing their revenue regimes as they seek access to increasingly internationalized mining investments (Otto, 2006). Countries with high royalty and taxation rates have tended to lower these while countries with low rates have increased their rates. Generally "the overall trend has been a reduction in

many taxes applied to mining."(Otto, 2006: xiv) Despite this harmonization there is still a great deal of variation between countries. As the authors of the World Bank study indicate, there is no one best system or rate for governments to maximize resource rent returns as every region has unique social and political circumstances requiring differing policies.

***Alaska***

In Alaska, the resource regimes for oil and gas are relatively well-known as they have been established since the early 1970s. Most of the resource rents are captured by the State of Alaska which uses several vehicles to capture this rent. The federal government does capture some of these rents but mostly in the form of federal corporate income tax or with developments on federal-owned lands. Oil and gas revenues in Alaska generally fund just over half of the State budget and 90% of discretionary spending. (Alaska Dept of Revenue, 2012).This rent is captured by the State through four main mechanisms: royalties, property taxes, state corporate income taxes, and production taxes. Royalties are paid by companies to the owners of lands that produce oil and gas. These royalties vary but general are 12.5% of the value of production. Royalties generally represent around 30% of State oil and gas revenues. The federal government also collects royalties on land that it owns but shares a portion of this (often about 50%) with the State. The federal government controls off-shore production but pays the State of Alaska 27% of royalties collected on properties that are between 3 and 6 miles off-shore.

The State corporate income tax is 9.4% of income over $90,000 and currently represents around 10% of State oil and gas revenues. Companies also pay property taxes on the value of their properties. While this does not represent a large percentage of total oil and gas revenues it is significant that local governments can also collect property taxes on these properties (which are deducted from state property taxes). These have been used by northern communities such as the North Slope Borough to capture some of these rents and create fiscal linkages (Morehouse & Leask, 1980). The other vehicle which Alaska uses to capture resource rents is a production tax. This is currently the largest source of capture. It is often a complicated measure with credits for a variety of activities.

These four vehicles allow the Government of Alaska to capture enough rent that Alaskans do not have to pay any state income tax or state sales tax. These revenues are therefore used to pay for most of the services of the state government. In addition, Alaskans created a capital fund, or sovereign wealth fund, to which a certain portion of yearly oil and gas revenues flow. This fund, the Alaska Permanent Fund, discussed below, was created to "prudently take some of the non-renewable oil wealth and transform it into a renewable source of wealth for future generations of Alaskans" (Alaska Permanent Fund, 2009: 5). The fund is primarily a state trust fund for savings but also pays out an annual dividend to all residents of Alaska.

In terms of mining revenues the regime in Alaska is quite different from that of oil and gas. While mining was basis of the economic development of Alaska for the first half of the 20th century, it currently contributes little to state finances. In 2012 the State of Alaska collected $41 million from the mining industry compared to the $6.1 billion collected from the oil and gas industry (Caldwell, 2013). A study of the mining industry done in 2006 noted that state mining revenue came from three main vehicles: annual claim rentals or mineral lease rentals on claims or leases on state lands, a royalty payment of 3% of the net income the company earns from the sale of minerals taken from state lands, and a mining license tax for mining operations on all lands in Alaska, whether private, state or federal (Rothe, 2006). Most revenues come from the mining license taxes which in 2004 represented $10,317,238 out of a total state mining revenue total of $13.7 million (2). Mineral rents and royalties represented $3 million of this total while corporate income tax was $323,000. The value of all mineral production in Alaska in 2004 was $1.06 billion.

While mining revenues represent a small contribution to state revenues, they are crucially important to the localities where mines are located. While mines contributed $13.7 million to the state in 2004, they also contributed $11 million to local governments through municipal or borough taxes. In 2012 the mining industry made $126 million in payments to Alaska Native corporations (Resource Development Council, 2013). The Red Dog Mine was the sole taxpayer to the Northwest Arctic Borough in 2012 and the payment that year was $13 million.

***Canada***

In Canada natural resources are primarily the responsibility of the provincial governments. In the Territories however it was the responsibility of the federal government until recently. Since the creation of Alberta and Saskatchewan in 1905, the territorial governments have slowly evolved towards having the same powers as provinces (Cameron & Campbell, 2009). This devolution of powers has increasingly been focused on the control of lands and natural resources since this is often seen as a primary focus of economic development and of financing for territorial initiatives. The devolution of political power from the federal government to the territories is furthest advanced in the Yukon. During the 1990s the federal government transferred responsibility for oil and gas development to the Yukon Territorial Government. Responsibility for other areas of resource development was transferred to the Yukon in 2003 (Alcantara, Cameron, & Kennedy, 2012).

The responsibility for land and resources in the Northwest Territories and Nunavut is still with the federal government although a devolution agreement was signed with the Government of the Northwest Territories in 2013 and is scheduled to be implemented later in 2014. A devolution agreement with Nunavut is currently being negotiated (Alcantara, 2013). While taxation and royalty regimes may change as territorial governments take over these new responsibilities, the experience with the Yukon is that territorial legislation will initial 'mirror' federal legislation until increased capacity allows the territories to alter the situation (Alcantara et al., 2012: 333).

While oil and gas production in the Canadian Territories has much potential, current production is very limited and as such information about resource rents is also limited. Oil and gas development in the Northwest Territories and in Nunavut is the responsibility of the Northern Oil and Gas Branch of Aboriginal Affairs and Northern Development Canada. On their website the royalty regime is described as being "one of the most competitive in the world" (Aboriginal Affairs and Northern Development Canada, 2014). Royalties are listed as being "1%, rising by 1% every 18 months to a maximum of 5% until project payout". After development costs are paid royalties are "the greater of 30% of net or 5% of gross". In addition to royalty payments, federal corporate tax rates are 16.5% (15% after 2012) and territorial/provincial corporate tax rates are between 10% and 11.5% (Alaska Dept of Revenue, 2012). There are currently no provisions for specific property taxes on resource developments in any of the Canadian

Territories or for production taxes. The existence of modern comprehensive land claims in the Canadian territories means that revenues are often shared with Indigenous organizations based on terms of the various treaties. Indigenous groups also control development where they own sub-surface rights (Irlbacher-Fox & Mills, 2007)

Mining royalties and taxation have been an issue of much discussion lately in northern Canada. Recent studies have pointed out that these royalty rates are among the lowest in the world and offer few benefits to northerners (Cizek, 2005; Taylor, Grant, Holroyd, Kennedy, & Mackenzie, 2010). Another study notes the difference between Northern Canada and Alaska and Norway where they "consistently collect more economic rent from non-renewable resources than Canadian jurisdictions do" (Irlbacher-Fox & Mills, 2007: 17). In the Yukon the royalty regimes differ between placer gold and other minerals. Placer gold is subject to a basic royalty of 2.5% per unit of gold based on a fixed unit price of $15 per ounce. As a result the Yukon collects 37.5 cents for every ounce of gold produced. In 2005 $30 million worth of gold was mined in the Dawson Mining District for which the Yukon Territorial Government collected $26,370 ( 13), or less than .09 of a percent of the produced value. With the then existing revenue sharing agreement the region's First Nations would have received $600 as their share of gold mining in the Dawson area.

For hardrock, or quartz, mining, the Yukon royalty system is based on profits from the mine and is a sliding scale. For profits from $10,000 to $1 million, 3% of profits are paid. This increased gradually until profits exceed $35 million. At this point royalties are 12% of profit (KPMG, 2011). The Northwest Territories and Nunavut have royalties collected by the federal government with identical royalty schemes. For these jurisdictions the royalty is the lesser of 13% of the value of production or a sliding scale based on profits that start at 5% for amounts between $10,000 and $5 million and rise to 14% for amounts over $45 million.

***Greenland***

Greenland's experience with resource regimes has primarily concerned mining although oil and gas exploration in the country started in the 1970s and has increased over the past few years. As of today there are no commercial oil and gas operations there. Mining in Greenland started in the

mid- 19th century and become important with the opening of the Ivittuut cryolite mine in the 1860s. Indeed during the last part of the 19th century and the first part of the 20th century this mine financed most state activities in Greenland (Sinding, 1992: 226). After World War II the expenses of the state surpassed the rent coming from mining but the Ivittuut mine continue to contribute until the 1980s. In the 1970s a lead-zinc mine at Maarmorilik was opened and operated until 1990.

As a colony of Denmark, all revenues from mining in Greenland flowed to Denmark until 1988. After Home Rule was implemented in 1978, a new fiscal arrangement was negotiated so that by 1989 resource management and revenue was to be shared equally between Greenland and Denmark. (Sinding, 1992). Under the self-government agreement of 2009 handed over all control of resource development to the Greenlandic government (Harsem, Eide, & Heen, 2011).

Following Home Rule, Greenland and Denmark jointly developed a new resource development strategy and a new mining act was introduced in 1991 (Sinding, 1992). Under the new law the state could claim both a tax and permit fee on five-year prospecting permits. Ten year exploration permits would require a fee, as would permits to allow a mine into production. Mines would pay a 35% income tax on profits after capital costs and other deductions are accounted for. Municipalities would not be allowed to tax mining companies.

Recently, the non-renewable resource sector has been the subject of much debate in Greenland (Areddy & Bomsdorf, 2013). In March 2013 a new government was elected largely due to a feeling that Greenland was not going to get enough benefit from several possible new mines that were hoping to open there. Under agreements with the previous government capital costs and deductions meant that Greenland would not get any revenues from these mines for many years. A new government was elected and a new arrangement was negotiated with the proponent of the largest mining project in October 2013. According to this new agreement a royalty, based on sales, would be payable if withholding tax and corporate taxes were less than the calculated royalty in a particular year. This would mean that the government would be guaranteed to get

some income from the project. The royalty was structured on a sliding scale with the first five years at 1% going up to 5% at 16 years and beyond (Kolver, 2013).

***Norway***

Norway's resource regime is probably the most well-known of Arctic states. Resource curse researchers often point to Norway's management of its oil and gas production as the best example of how to manage non-renewable resources (Listhaug, 2005; Thurber, Hults, & Heller, 2011). Unlike other countries, Norway has implemented a system where the state captures around 80% of rents from oil and gas development (Gylfason, 2001).

Norway's current resource regime is linked to a long standing tradition of national state control of natural resources. The Norwegian state in highly centralized and while recent changes concerning Finnmark have eased this centralized control, the resource regime is almost entirely controlled by the national government. The current legislation governing oil and gas development is derived from "Concession Laws" developed to control foreign involvement in hydro-electric development at the beginning of 20$^{th}$ century (Ville & Wicken, 2013). While Norway lagged behind similar countries in terms of economic development through most of the 20$^{th}$ century, the discovery of oil and gas in the North Sea offshore of southern Norway in the early 1970s transformed the economy turning it into one of the most wealthy in the world (Larsen, 2005).

The present system has evolved continuously since then but has been marked by the desire to both ensure that resource rents are captured and used to the benefit of all Norwegians and to avoid the Dutch Disease that first accompanied North Sea oil and gas development (Larsen, 2005). It is different from other jurisdictions in that it no longer captures rent through royalties. Instead it does so through taxing the profits of producing companies, through dividends from Statoil, the state oil and gas company, and by ensuring it is an equity partner in most projects. (Persily, 2011).

Oil and gas companies in Norway are taxed at a normal business rate of 28% of profits. In addition, there is a special 50% tax on offshore oil and gas production meaning that this production is taxed at a marginal rate of 78% (Persily, 2011). All current oil and gas development in Norway is offshore. Tax concessions are sometimes awarded to encourage investment in difficult projects such as the Snohvit offshore development in the High North. Companies may also pay property taxes on onshore infrastructure to municipalities. Whether there is property tax and what these rates may be vary by municipality.

In addition to taxes, the Norwegian state owns 67% of the Statoil oil and gas company, a company it created in 1972. Through Concession Law negotiations it has ensured that Statoil controls a large share of activities in Norway (Persily, 2011; Ville & Wicken, 2013). All of the dividends from Statoil flow to the government. In addition to Statoil, the Norwegian state has forced oil and gas companies to include them as an equity partner. Through another state-owned company, Petoro, Norway owns a percentage of most oil and gas developments above and beyond the share owned by Statoil. Indeed, this is currently the major source of oil and gas revenues for the state (Persily, 2011).

In order to save resource rents for future needs, and especially in order to avoid the economic problems associated with Dutch Disease, the Norwegian state transfers all of these rents into a fund called the Government Pension Fund – Global. Despite its name it is a sovereign wealth fund and not a pension fund. As this fund invests primarily outside Norway, the negative impacts that large resource rents can have on a domestic economy are lessened. The fund is often portrayed by both international financial institutions and the international media as the best example of dealing with oil and gas rents (Velculescu, 2008). The government can take out up to 4% of the asset value of the fund each year but unlike the Alaska Permanent Fund, no moneys are distributed directly to the public. The fund is currently the largest sovereign wealth fund in the world.

Unlike the oil and gas industry, the mining industry in Norway is not subject to any special taxes and pay normal corporate tax rates. Certain municipalities in northern Norway that are close to

mining operation would like to see a new mining tax. It is hoped that proceeds from such a tax could go to local communities to mitigate increased demands on these communities (Karlsbakk, 2012).

***Russia***

Russia is one of the world's largest producers of natural resources. It is one of the largest exporters of crude oil with close to 13% of world production (Deloitte, 2012). It accounts for 18.4% of all natural gas production in the world of which 90% is exported. In terms of mining it is the world's largest producer of chromium, nickel and palladium, and is the second largest producer of aluminum, platinum and zirconium. In 2009 the mining and metallurgical industries accounted for almost 20% of the country's industrial output and around 15% of Russia's total exports (CountryMine, 2009).

The Russian resource regime has changed considerably over the past 20 years since the fall of the Soviet Union. Today it has a regime that is heavily controlled by the state (Deloitte, 2012). State controlled companies dominate the oil and gas sector and there are severe administrative restrictions (Thurber et al., 2011). Apart from the diamond sector which is largely controlled by the state, mining in Russia is controlled by large private sector firms that are led by prominent wealthy Russian businessmen. Industry analysts contend that the Russian state can exercise "indirect control through some of the oligarch promoters who owe allegiance to the Kremlin" (Thomas White Global Investing, 2011: 8). Increasingly these firms are creating new relations with foreign investors and foreign firms in order to internationalize their operations.

The main regime in the oil and gas sector is a combination of taxes and royalties although a few developments are governed by production-sharing agreements (Goldsworthy & Zakharova, 2010: 9). Over 80% of state revenues come from a mineral extraction tax (MET) and an export tax. The MET is a volume-based royalty rate that in 2010 was 419 rubles per metric ton. This rate is adjusted periodically depending on prices in the world market. The MET is adjustable based on the source of the oil and gas. New and riskier fields have lower MET rates in order to encourage investment. The export duty is based on a sliding scale related to the market price of

the oil and gas. In 2010 marginal rates were 35 percent for the market price in excess of $15 per barrel up to $20 per barrel; 45 percent for the excess over $20 per barrel to $25 per barrel; and 65 percent over $25 per barrel. A separate export duty exists for refined products. The Corporate Income Tax on oil and gas in Russia is 20% with deductions for MET and export duties as well as for investments based on the maturity of the fields. This is also applicable to mining operations. Of this percentage 2% goes to the federal government and 18% to the regional government. It is possible for the regional government to reduce their amount by 4.5% to encourage development (PricewaterhouseCoopers, 2012).

A value added tax of 18% is paid on oil and gas sold domestically. Other taxes include a dividend withholding tax of 9 percent for residents and 15 percent for non-residents, an interest withholding tax of 20 percent, unified social tax of 2 percent to 26 percent of gross payroll, a property tax of up to 2.5 percent of assets, and import customs duties ranging from 5 percent to 30 percent (Goldsworthy & Zakharova, 2010: 11). All of this means that for every dollar worth of oil and gas exported from Russia, the government gets 90 cents when the price is over $25 per barrel.

In terms of the mining industry, in addition to the same corporate income taxes as oil and gas companies, production is subject to the Mineral Resources Extraction Tax. This is a royalty-like tax which is applied to the value of the extracted resource (PricewaterhouseCoopers, 2012). The tax varies by the type of material mined. Copper is taxed at 8%, gold at 6%, and iron ore at 4.8%. Most of these taxes go into the federal budget and are used to pay for government services across Russia. At the same time, Russia has created sovereign wealth funds that are used to pay off external debt, as future savings, and as a means of financial stabilization (Tsani, 2013).

In terms of local control over resource rents, historically Russia has been a very centralized system (Riabova, 2001). Following the fall of the Soviet Union there was a movement towards the decentralization of power towards regional governments but this has been reversed over the past 15 years (Libman, 2010: 7) . In addition, the new private/public sector resource firms with strong connections to the federal government are increasingly influential in local and regional

decision-making (Tynkkynen, 2007: 856). The currents system is highly centralized. Regional governors are no longer elected by regional populations are instead appointed by the Federal president. At the same time, regions with large resource developments benefit from resource rents. They receive a share of the MET and other taxes and receive direct contributions from resource companies in their efforts to ensure good relations with the region (Libman, 2013: 86). These are used to provide public goods to those living in the region. As a result, despite the centralized nature of the Russian political system, those regions with resources often have higher level of services.

***Sweden and Finland***[i]

Neither Sweden nor Finland has important oil and gas developments but they both have relatively long histories of mining. Sweden and Finland have both been noted recently as being jurisdictions favored by the mining industry due to their low taxation policies (Wilson, McMahon, & Cervantes, 2013). One industry review of Sweden's taxation policy noted that companies there only have to pay 22% of gross profit and that this low rate is unsustainable (GMP Securities, 2013: 9). In Finland, mining companies are required to pay the common corporate tax rate of 20% of profits minus deductions. An additional mining tax is currently under discussion. Local communities in northern Norway, northern Sweden, and northern Finland are hoping that funds from a mining tax could be used to assist these communities deal with the impacts of mining in their regions (Karlsbakk, 2012).

Both Sweden and Finland have highly centralized national states. All resource taxes go directly to the national government and are then redistributed according to the desires of the central government.

**Five Key Questions**

This review has confirmed that a range of experts believe resource development can now be done differently than it has in the past and that new conditions exist that offer the potential for this type of development to offer more benefits than costs to Arctic communities. New resource regimes offer possible new means of increasing fiscal linkages to these regions. At the same

time, in order to increase the possibilities of this happening, key research questions have to be answered. This section outlines five key questions that ReSDA research can help answer in order to increase the chances of resource development helping, rather than hurting, the sustainability of these communities.

1. Where does the money go in Arctic resource development?

The first area that we need to clarify is where exactly the money from Arctic resource development goes. If we want to find out about how to increase fiscal linkages we have to have a better idea of what money is produced by these operations and where this money goes. The brief discussion above concerning the resource regimes of the various Arctic regions gives us an idea but very little research exists in more detail. ReSDA would be wise to undertake a series of case studies that attempted to get a better idea of how to measure linkages and leakages in an Arctic context.

Attempting to measure linkages and leakages may not be easy. ReSDA research could identify what fiscal indicators currently exist that can do this. This research would need to evaluate the relative value of these indicators and the ease with which they could be accessed. The ideal would be to develop a model of measuring linkages and leakages that could be used by Arctic communities and regional government so that they would have better idea of where the money from resource development goes.

2. Which resources regimes give the greatest fiscal linkages to northern communities?

Empowering communities and regions to be able to track resource development money would greatly assist them in trying to answer the next research question – how to increase linkages and decrease leakages. This is perhaps the central key question of this research area – one that would provide the most useful information. We want to find out how they vary across types of resource measures and types of resources with the goal of determining the regimes that maximize fiscal benefits for the north and most limit leakages out of the region. Our review of the various regimes across the north has revealed a great deal of variation based on a number of factors

including the degree of political decentralization and the existence of new comprehensive land claims.

A large amount of information is available for Alaska and Norway as they are often described as having effective regimes for capturing resource rents. The government of Alaska appears to capture a large degree of resource rents when compared to its federal government. In addition, the ANCSA treaty has given indigenous communities a variety of tools they can use to also capture some of these rents. In Canada the situation varies depending upon the state of devolution towards the territorial governments in that the Yukon seems likely to be able to capture a fairly large share of resource rents. Nunavut still depends largely on the federal government to forward rents to them. New comprehensive land claims have enabled communities such as the Selkirk First Nation and the Inuvialuit to have at least the potential to capture a share of resource rents.

In Greenland, self-government has meant that the Greenlandic government is well positioned to capture resource rents although there has been much debate about the tools that should be used to capture these rents. Norway has used its oil and gas to fund a well-developed welfare state but its system is highly centralized and little evidence exists of how its northern communities can exercise direct control over rents. Sweden and Finland are also highly centralized and in addition appear to be much less concerned about capturing resource rents hoping instead to attract investment in order to gain non-fiscal linkages.

Russia has a highly centralized system of resource rent capture but at the same time has an institutionalized system for sharing some of the returns from resource development with regional governments. In addition, companies appear to be willing to offer financial and other incentives to local communities in order to secure good will.

3. What are the best vehicles for saving resource revenues? What attempts have northern governments made to save resource revenues? How have laws and regulations, differences among community members, spending needs, and other impediments limited savings?

Linked to the question of maximizing fiscal linkages is a more specific question relating to the best vehicles for gathering and saving revenues. Several authors have started research looking at various types of funds and their relative value for resource dependent regions (Baena, Sévi, & Warrack, 2012; Humphreys & Sandbu, 2007; Tsani, 2013). This research often points out that two of the most successful are the Alaska Permanent Fund and the Norwegian Government Pension Fund – Global. Can these funds be replicated in other regions of the Arctic? The territorial government of the Northwest Territories is in the process of establishing such a fund. What lessons can be learned from Norway and Alaska and other non-Arctic regions?

Resource savings funds do not necessarily have to be large-scale. Various arctic communities have implemented different types of smaller funds that they attempt to use in order to stabilize development associated with natural resource exploitation. Often these are linked to Impact Benefit Agreements. Yet very little is known about what funds exist and what forms they take. The confidential nature of some Impact Benefit Agreements may limit the ability of researchers to examine these funds but ReSDA research could be done which tried to understand how and why some of these community-based funds are successful and why some are less so.

4. What are the best ways to distribute resource revenues to communities?

If research leads to a better understanding of how to increase linkages and decrease leakages, and if we find out new ways of saving the fiscal benefits of doing this, another key question is how best to spend these benefits. One of the most important objectives is to use this funding to try and transform the finite nature of natural resource exploitation into sustainable forms of development. In addition, funding may be necessary to mitigate negative impacts. What is the best way of doing this? Some research exists relating to the Alaska Permanent Fund and the Norwegian Government Pension Fund – Global on the best ways of doing this. Discussion is occurring around whether or not distributing benefits directly to individuals, as is done by the Alaska Permanent Fund, is a good thing or a bad thing (Baena et al., 2012).

The resource curse discourse has emphasized the problem of corruption that is associated with the distribution of resource profits. This research notes the importance of good institutions in

order to avoid this problem. It would be useful for ReSDA research to look at the best ways of avoiding these issues as they may affect the Arctic.

Impact benefits agreements and similar arrangements between communities and industry often contain funding that is to be distributed to communities for a variety of reasons. Once again, the confidential nature of these arrangements makes it difficult for researchers to study these examples of distribution. The need for transparency is now almost universally accepted as something that is necessary in order to ensure that moneys are used more effectively to benefit communities affected by resource development. By working closely with community partners ReSDA researchers could assist them in understanding how effective various community-based distribution systems have been for communities.

5. To what degree does resource regime structure affect production decisions?

Finally – if we communities decide they want to see resource development occur, they have to know how decisions that they make concerning resource development will affect whether senior governments and industry proceed with production. We have to know more about how investment decisions are made – both by industry and senior governments. We are interested in the tradeoff between the direct and indirect effects of fiscal measures on resource revenues. When governments consider adjusting resource revenues to encourage more production or to increase revenues, will these adjustments work? These are all research questions that future ReSDA research could help answer.

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