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Diaspora and Development

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1. INTRODUCTION

AMONG Professor Bhagwati's major scientific contributions is his work on international migration of labour, dating back to his influential theoretical analyses of skilled migration almost four decades ago and continuing with other recent ideas such as the need for a World Migration Organisation. Bhagwati was also stimulated by Johnson's (1965) and Grubel and Scott's (1966) early discussions of the 'brain drain' phenomenon. His pioneering contribution here is on the analysis of appropriate taxation in the presence of international mobility of skilled labour.[1] Bhagwati's proposal for a tax on skilled migrants (Bhagwati and Partington, 1976; and Bhagwati and Wilson, 1989), now known as the 'Bhagwati tax', has led to extensive policy discussions, most recently by economists and political scientists such as Desai et al. (2001).

The most notable aspect of Bhagwati's work in this area is that it represents the earliest theoretical analysis of what we would call today, as he himself suggested early on, the 'Diaspora model'. Whilst Bhagwati's early work aimed at issues relating to taxation of the diaspora, today we would extend the model to encompass interactions such as remittances which have grown immensely beyond levels imagined by Bhagwati and others in the 1960s, and the diffusion of technology that seems to occur massively from Silicon Valley to IT centres in Taiwan and India (and indeed back to Silicon Valley also). While the remittance issue is equally important, and perhaps more so with unskilled migrants who are more likely to send moneys back to their poor parents and siblings and nuclear families than are the skilled migrants, the technology diffusion aspect cries out for analytical treatment.

We propose to do this by drawing on a model developed by Findlay (1978). Whilst the beginnings of international flows of human capital are to be traced to the 1960s and 1970s, recent data suggests that emigration of skilled people from

[1] His work in this area has resulted in two influential volumes on 'taxing the brain drain' (Bhagwati and Partington, 1976; and Bhagwati, 1976), and the volume edited with his student John Wilson (Bhagwati and Wilson, 1989).

the developing countries continues unabated. Among the Asian countries, 39 per cent of educated Vietnamese lived abroad and the figure for Hong Kong was around 29 per cent in 2000. But in absolute terms, Philippines (1.3 million), India (1 million) and China (0.9 million) have the largest stocks of skilled emigrants abroad. The essence of the diaspora model is that skilled emigrants have much to contribute to the development of their home countries over and above the resource allocation effects identified by the so-called cosmopolitan model of the brain drain developed by Johnson (1965) and Grubel and Scott (1966). In his recent book *In Defense of Globalization*, Bhagwati (2004) commends the model to countries such as the Philippines, India, Taiwan and China, which are capable of generating large stocks of skilled people and for whom emigration of skilled workers provides an opportunity to reap benefits in the form of skills and finance.

Several factors have shaped the model. First, the substantial remittances repatriated to their countries of birth by emigrants. Available data suggests these sums exceed the amount of foreign aid many of these countries receive. Second, is the FDI undertaken by the diaspora in their countries of origin. These sorts of long-term investments though are mostly from the Chinese and to a much lesser extent the Indian diaspora. Total investments by Indian expatriates (NRIs) over the period 1991–2001 is put at $2.6 billion out of $10 billion of FDI in India. Even that is meagre compared with around 70 per cent of the $196 billion FDI stock received by China during the late 1980s and 1990s. There are several reasons for the relatively low volume of diaspora investments in India which are discussed elsewhere (Balasubramanyam and Mahambare, 2003) and are not central to this paper. Third, is the technology and know-how the diaspora make available to their countries of origin either as a part of their FDI or through arrangements such as technology licensing and joint ventures. Such transfers are of significance in the case of the Indian software industry, which owes much of its growth to the Indian diaspora in the Silicon Valley. Fourth, is the visible growth in the number of skilled emigrants who are returning to their countries of origin after a long sojourn and accumulation of savings abroad. Fifth, is the growth in the to-and-fro variety of migration recognised by Bhagwati, professionals who move between their adopted and home countries fairly frequently for reasons of business and other professional activities. In sum, the diaspora are returning to their roots and, as Bhagwati argues, countries such as India and China should extend a warm embrace to their nationals abroad so that technology and know-how spillovers can increase. This paper argues that Bhagwati's advice is well-founded, not only because the diaspora are a fertile source of technology and know-how but also because they are able to implant and spread such know-how in their countries of origin much more effectively than other sources such as FDI from non-diaspora sources. Put differently the social rate of return to a unit of investment by the diaspora is likely to be higher than that in the case of non-diaspora FDI.

2. IMPACT

Our central proposition rests on several identifiable characteristics of diaspora participation in their countries of origin. That contribution occupies an intermediate position between inflows of FDI (flows of capital to labour) and immigration (flows of labour to capital). It is the contribution of capital made by the diaspora that is emphasised in the literature. No doubt the diaspora do invest; they have the means to do so. For example, based on estimates of median income, Indian-born residents in the US comprise one of the highest-paid groups in the country, and the wealth generated by Indian IT experts in Silicon Valley is more than half of India's GNP. Since 1979, overseas Chinese investment (mainly from Hong Kong, Macao and Taiwan) has been the dominant source of FDI flows to China, and in 1992 their share was over 80 per cent of the total $11 billion. In recent years, however, it has decreased. Even so, 45 per cent of a total $41 billion FDI was from Chinese diaspora in 2000 (Wei, 2004). Apart from bringing capital to labour they also, perhaps more importantly, bring labour skills to capital. The skills they transfer to their countries of origin are mostly tacit knowledge, rather than knowledge embodied in capital equipment.

There are other significant differences between diaspora involvement in their countries of origin and non-diaspora FDI. First, the motives and pattern of diaspora investments are significantly different from that of traditional FDI. They may be guided not only by profit motives but also by long-run considerations of establishing a base. Second, for a variety of reasons, externalities, a recognised contribution of FDI to host countries, is a feature of diaspora investments. This is because the diaspora are likely to be better informed on the capabilities and requirements of domestic labour and the sort of training local labour requires. Third, quite often the factors which influenced the diaspora to migrate from their homelands may influence the extent of their involvement and contribution to the development of their countries of origin. In this context it is interesting to note an explanation given for the low involvement of the Scottish diaspora in the Scottish economy compared with the active involvement of the Irish diaspora in the economy of Ireland. It is said that the former are not all that keen on contributing to Scottish development as they are mostly professionals who left Scotland voluntarily and look upon it as a miserable left-wing place. In contrast, the Irish diaspora were poor and unskilled and pushed out into exile by the English, and take pride in their new-found ability to liberate Ireland economically (*Economist*, 20 October, 2001).

It is, though, arguable whether the large number of skilled people who emigrated to the US and the UK from India, for instance, were pushed out or pulled in by the lure of enhanced salaries. It is likely that both contributed to their decision. The push factors include discrimination in job markets on the basis of caste, crippling bureaucracy and red tape, and the sheer lack of employment appropriate

for the skills and academic qualifications the prospective emigrants possessed. Much like the Irish, those Indians who were pushed seem to be enthusiastically contributing to the development of their home country. Why should those pushed out participate in economic regeneration of the country which pushed them out? Perhaps they are able to empathise with the plight of those left behind: they are keen that the younger generation should not suffer the trials they faced prior to emigration. Admittedly the profitable investment opportunities their countries of origin now offer may also strengthen their desire to actively participate in its growth and development. Fifth, diaspora involvement may contribute to growth of human capital and increased flows of non-diaspora FDI to these countries. Sixth, whilst diaspora investments may encourage temporary migration of skilled labour from the countries of their origin, they may serve to limit permanent migration.

These propositions are admittedly intuitive and require empirical verification, although studies based on information gathered through interviews with the Indian diaspora in the Silicon Valley and software firms in India do provide some support for them (Balasubramanyam and Balasubramanyam, 2000). Here we attempt to anchor them in models of technology transfer developed by Findlay (1978) and the brain-drain model developed by Bhagwati and Hamada (1974).

3. THE FINDLAY MODEL

Findlay's model provides a synthesis of the Gerschenkron-Veblen proposition concerning economic backwardness and a proposition concerning the contamination effect of FDI. The former states that:

> the rate of technological progress in a relatively backward region is an increasing function of the gap between its own level of technology and that of the advanced region which improves at a constant rate.

The idea here is that the greater the backlog of opportunities in the backward country, the greater the pressure to adopt them and catch up with the advanced region. The contamination proposition suggested by Arrow (1962) is that technical innovations are most effectively copied when there is personal contact between the innovators and imitators. Such personal contacts spread and diffuse technology effectively, much like a contagious disease. In Findlay's model the contaminating agents are foreign firms which transfer technology to locally owned firms. Findlay's synthesis of the two propositions rests on a model which posits the rate of technical change in the backward country as a function of the initial distance of the technological levels between the backward and the advanced country and the proportion of foreign investment to domestic investment in the backward country. The rate of technical progress in the domestic

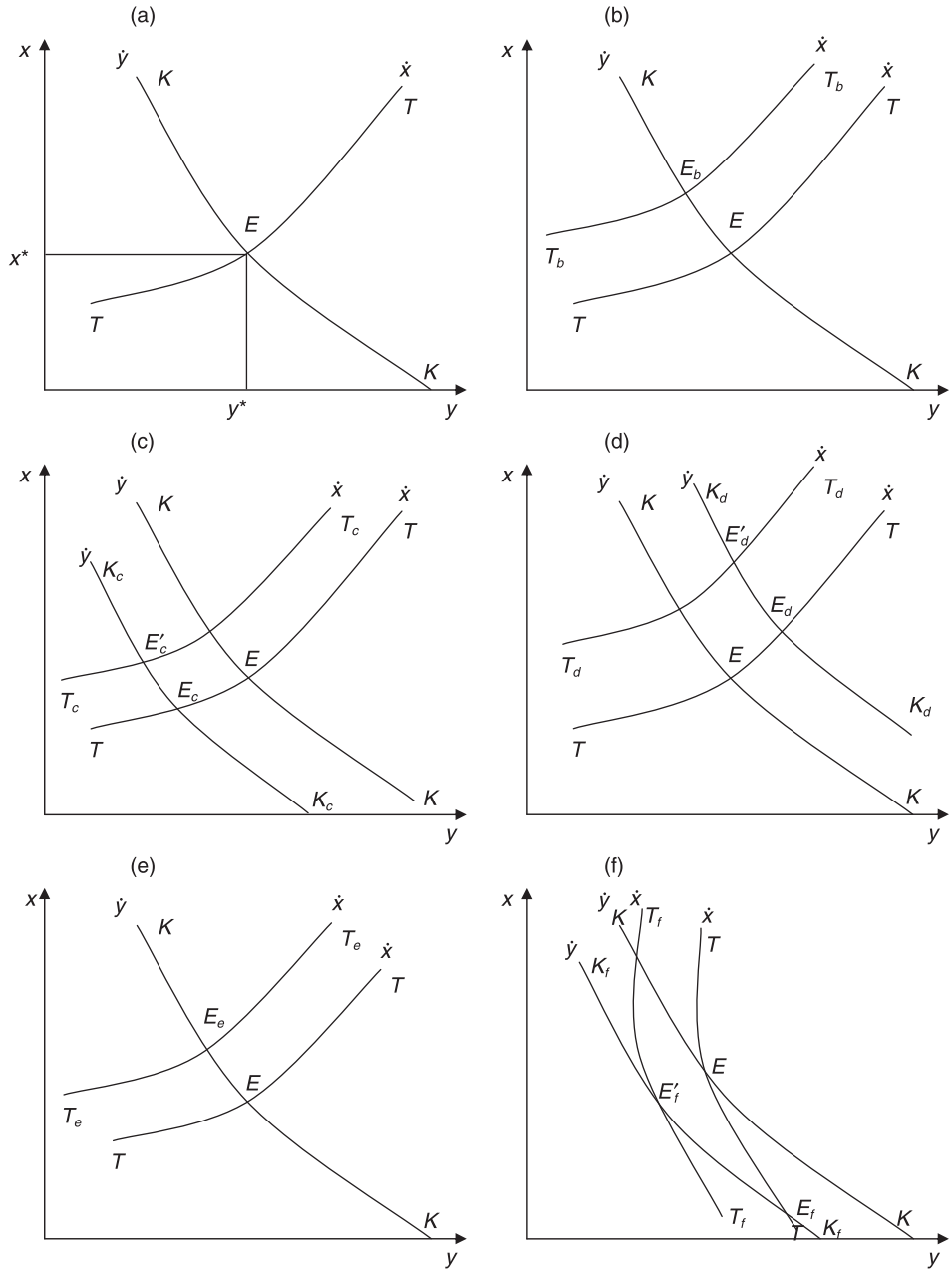
sector varies inversely with technological distance (backwardness proposition) and directly with the proportion of foreign to domestic investment (contagion proposition).

In Figure 1, the level of technology in the backward country (B) as a proportion of the level of technology in the advanced foreign sector (A) (i.e. $x = B/A$) is plotted on the vertical axis and the ratio of the stock of foreign capital (K_f) to the stock of domestic capital (K_d) (i.e. $y = K_f/K_d$) on the horizontal axis (Figure 1a). Given the assumption that high levels of backwardness result in high rates of technical change in the backward sector relative to that in the foreign sector and high levels of foreign to domestic capital stock also generate increased rates of technical progress, the $\dot{x}$ curve (TT) slopes upward. Along the TT curve the percentage rate of technical change in the domestic sector equals the given rate of technical change in the foreign sector. High levels of backwardness go along with low levels of foreign to domestic capital stock to generate this equality in the percentage rates of technical change. An upward movement along the curve suggests a declining impact of the backwardness effect but an increasing impact of the contagion effect. Along the downward-sloping $\dot{y}$ curve (KK), the rate of change of foreign capital stock equals the rate of change of domestic capital stock. As B/A increases on the vertical axis (backwardness declines) both the rate of profits and the wage bill increase in the domestic sector leaving the savings available for investment unchanged. And as the foreign sector pays a wage rate higher than that in the domestic sector, the foreign sector's wage bill increases at low levels of backwardness and reduces its after-tax profits available for investment. So a combination of low levels of backwardness and low levels of foreign to domestic capital stock results in the equality of the rate of change of capital stock in the domestic sector with the rate of change of capital stock in the foreign sector all along the downward-sloping KK curve. The intersection of the TT and KK curves (point E in the graph) determines the long-run steady-state rate ratios of technical efficiency x^* and ratio of foreign to domestic capital y^*.

Now a shift in the upward-sloping TT curve to the left, signifying increased technical progress in the backward country, say due to skill formation, will result in an increase in the domestic level of technology to that of the foreign sector, and a decline in the ratio of foreign to domestic capital. If the rate of technical progress in the foreign sector increases it would shift the TT locus to the right, resulting in a decrease in the relative level of technology and an increase in the ratio of foreign to domestic capital. Any decline in the ratio of foreign to domestic capital would decrease the rate of technical progress in the country because of a weakening of the contagion effect.

The foregoing provides an intuitive summary of Findlay's model. How best to utilise the contagion effect and/or increase skill levels in the country? It is in this context that diaspora involvement is likely to be significant. This can take various forms.

FIGURE 1
Phase Diagram



First, the diaspora may provide technology and know-how to the domestic sector, as in the case of licensing agreements, without commitment of capital. Indian software firms, for instance, benefit from outsourcing arrangements with diaspora software firms in the US. The diaspora firms provide the specifications for the software to be manufactured and also a market for the product. Visits to Indian firms by the diaspora – the to-and-fro variety of labour movements identified by Bhagwati (1977) – may also provide technical know-how. This would serve to shift the TT curve to the left (T_bT_b), resulting in increased levels of technology and reduced dependence on foreign firms (Figure 1b). This could also be regarded as a contagion effect – the technology virus (as it were) is carried from the US by the diaspora, who themselves would have caught the virus through their work and learning-by-doing in American firms, and it is dispersed among the firms in the countries of their origin. Admittedly this is not a free good; the diaspora have to be paid royalties or fees, and in the case of outsourcing, local firms are paid a fixed sum. Such skill formation would of course increase wages locally but labour productivity would be commensurately high because of the contagion effect. This is likely to be much stronger than in the case of FDI by foreign firms or, for that matter, stronger than in the case of licensing agreements between locally owned and non-diaspora foreign firms. This is because, as argued earlier, the contagion effect is likely to be stronger when there is personal contact between innovators or carriers of the technology virus and receivers. Such personal contacts are likely to be the norm in the case of diaspora investments because of a shared culture and language with domestic labour.

A second avenue of involvement is direct investment in the locally owned firms, either through joint ventures or acquisitions or through the setting up of greenfield ventures. In the case of joint ventures the ratio of domestic investment plus diaspora investments to non-diaspora foreign investments is likely to increase. This would shift the KK curve to the left (Figure 1c). Findlay suggests this would be the result if domestic investments increase as a result of growth in domestic savings, but it would lower both the extent of foreign investment in the country and the rate of technological change, because the contagion effect would weaken. Findlay, however, allows for the possibility that increased savings may enable the country to adopt advanced technology more intensively, resulting in a shift of the TT curve to the left, arresting the decline in technical progress. In the case of diaspora investments in locally owned firms, technology is imparted by the diaspora and, for reasons stated earlier, the contagion effect of such investments is likely to be relatively strong. This would shift the TT curve to the left (Figure 1c). Thus diaspora investments are likely to be much more contagious and beneficial to the local firms than increased foreign investment.

But should we treat diaspora acquisitions or greenfield investments as domestic investment? It could be argued that these are in the nature of foreign investments. This, though, would not affect our proposition. Diaspora investments treated as

foreign investments would increase the ratio of foreign to domestic investments and shift the *KK* curve to the right, resulting in both increased foreign presence and technical progress in the host economy (Figure 1d). Indeed, it can be argued that along with a rightward shift in the *KK* curve there would also be a leftward shift of the *TT* curve, resulting in reduced foreign presence as a whole or leaving it unchanged and raising the rate of technical progress (Figure 1d). The reduction in foreign presence may come about because of a substitution of diaspora investments for foreign investments.

A third interesting source of contagion relates to situations when the diaspora assume top managerial positions in foreign-owned firms in their countries of origin. Here again the effect could be strengthened because of the familiarity of the diaspora with local markets, including labour markets and knowledge of local norms and customs. A major benefit of FDI to host countries recognised in the literature is the transfer of technology and know-how from foreign-owned to locally owned firms. The precise mechanisms of such spillovers, though, are not identified. Indeed, there is considerable doubt expressed in several studies on the extent of such spillovers (Greenaway and Gorg, 2004; and Haddad and Harrison, 1993) and some even identify negative spillovers from the presence of foreign firms. One channel for such spillovers or contamination, though, could be the presence of diaspora in top managerial positions in the foreign-owned firms. Endowed with knowledge of the local economy and location advantages they may be better equipped to identify and nurture local suppliers of components and also organise training and learning-by-doing for the local labour force they employ. Diagrammatically, this is similar to the first case (Figure 1e).

A fourth variant of the diaspora model relates to a case identified by Findlay. It is suggested that the presence of foreign firms may, in fact, deter rather than promote technological progress. Their sizeable presence may dwarf the locally owned firms. In other words, the rate of technological progress may be an inverse function of the ratio of foreign to domestic investment resulting in a downward-sloping *TT* curve (Figure 1f). This would indeed limit technical progress in the local economy. Now if diaspora investments are introduced into the model the negative effect of foreign presence could be arrested. This would require the assumption that whilst the rate of technical progress is an inverse function of foreign presence, it would be a positive function of the growth of diaspora investments. Whilst the former assumption may have some justification the latter needs explanation. It is likely that locally owned firms and the local economy in general see the diaspora as much less of a threat than the non-diaspora foreign firms, simply because of their cultural affinity with the diaspora. Also, diaspora investments are likely to be relatively small in size. For these reasons growth in diaspora investments may arrest the adverse foreign firm effect, especially if diaspora investments are substitutes for foreign investments, limited though such substitution may be, and if diaspora investments enhance local skills.

It is, though, debatable whether each and every type of diaspora investment augments the technology contamination effect. In the case of diaspora investments in relatively unskilled labour-intensive activities, there may be little by way of technology transfer, but such investments could generate employment opportunities for the unskilled unemployed and promote exports. This sort of investment would conform with the vent for the surplus model of trade developed by Myint (1958). The growth of exports and employment resulting from the Chinese diaspora investments in the export processing zones in China and the town and village enterprises is a case in point (Fu and Balasubramanyam, 2005).

4. THE BHAGWATI-HAMADA MODEL

In the Findlay model there is no discussion of movement of labour between the domestic and foreign sectors and no discussion of employment effects. The Bhagwati and Hamada (1974) model addresses this. The model discusses a variety of situations which might result in growth of unemployment of educated people and a reduction in national income. Here we confine the discussion to the case where skilled people emigrate from the country and the impact of such emigration on employment.

The model posits two sectors – the skilled sector (M1) which employs only skilled people and produces goods in conjunction with other factors of production, and an unskilled sector (M2) which employs only unskilled labour and produces goods. The wage rate in the skilled sector is higher than in the unskilled sector and there is downward wage rigidity in both. Now, if a certain proportion of skilled labour emigrates to developed countries the expected wage rate in the skilled sector would increase both because of the emulation effect – a possible increase in wages reflecting that in the advanced countries or because the pool of skilled labour is reduced. Now if the supply of educated labour increases because the expected wage in the skilled sector is relatively high, unemployment in the skilled sector is a distinct possibility. This would be so if the elasticity of demand for educated labour is less than unity, and supply increases but demand decreases. The situation could be worse if the wage rate in the unskilled sector increases because of leap-frogging. In this case there could be unemployment in the unskilled sector too depending on elasticity of demand. This highly simplified version of the Bhagwati-Hamada model suggests that migration of skilled labour may result in increased unemployment in the country and if the costs of education are also taken into account it might also reduce national income.

Our purpose here is to analyse the implications of diaspora investments for employment and incomes. The impact can be classified into two effects. First the emulation effect of consumption patterns. The superior consumption patterns of returning or visiting diaspora may set in motion a demand for higher wages and

a reduction in savings in the economy. And any increase in wage rates would, much like in the Bhagwati-Hamada model, increase the supply of skilled workers, for it is skilled labour that can demand and obtain higher wages, and again depending on the elasticity of demand for skilled labour unemployment of skilled labour may increase.

The second case is one where the diaspora actively engage in economic activity in their home countries through investments of the sort discussed earlier. The diaspora would be competing for skilled labour and the wage rate in the diaspora sector could be expected to be higher than in the domestic skilled sector. If demand for skilled labour is greater than unity there would be increased employment in the diaspora sector. But this movement of labour is likely to be from the skilled domestic sector and this would increase the wage rate in the skilled domestic sector. The movement would cease when the wage rates in the two sectors are equalised. The presence of the diaspora would thus serve to increase wage rates for skilled labour. It is likely that the level of unemployment may also decrease because of the presence of the diaspora investments. However, if the demand for labour in the domestic sector is less than unity, increased wages in the sector may result in unemployment. The supply of labour from the unskilled sector may also increase in response to the higher expected wage in the other two sectors, and this again may result in unemployment of the educated labour force. All this mirrors the Bhagwati-Hamada case of emigration of skilled labour.

The presence of the diaspora sector, however, may have another effect which can be termed the brain-gain effect. As discussed earlier, this would be the contagion effect which would disperse technical and managerial skills. On-the-job training and the marketing know-how provided by the diaspora may serve to increase the skill levels and exports of the country. Here the assumption is that the diaspora bear the costs of education. Also the facilities for work and the learning environment they provide may be superior to that in locally owned firms, mirroring the work practices and management techniques in the developed host countries of the diaspora. This sort of a brain gain may arrest flows of emigration of skilled labour. If the migration of skilled labour is in response to the sort of facilities for work which is available abroad, the diaspora may be able to replicate such facilities at home. For these reasons the presence of the diaspora may result in increased skill formation, reduction in the levels of migration and it would also result in increased productivity matching the increased wages.

5. CONCLUSIONS

The conclusions of the paper can be briefly stated. First, the presence of diaspora in their countries of origin may serve to intensify the so-called technology contamination effect of FDI. For several reasons, most importantly the superior

location advantages the diaspora enjoy, they may be highly effective carriers and contaminators of the virus of technology and know-how. And the sort of externalities associated with FDI may also be higher. They may also serve as effective conduits of technology from non-diaspora foreign-owned firms to domestic firms in their countries of origin. Their presence may also serve to limit some of the costs associated with FDI such as negative spillovers. The paper, however, has not fully discussed the determinants of diaspora investments and has not elaborated on the impact of their presence on employment such as the ones identified by Bhagwati and Hamada in the context of the brain-drain phenomenon. It has not also discussed the various policy proposals for increasing diaspora involvement in their countries of origin.

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