RESEARCH NOTE

Determinants and Effects of International Remittances: Evidence from Ratnagiri District of Rural Maharashtra

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Abstract

International emigration and remittance inflow is not a novel phenomenon for India. The present study examines the factors influencing emigration and size of remittance inflow. It also examines the effect of remittances on the economic wellbeing in terms of expenditure of the recipient households. In India, the remittance inflows are important source of funding for the recipient households in rural India. However, the studies focusing on the impact of international remittances on rural household wellbeing in India are rarely found in the literature. The study is based on the primary data collected from the villages in Ratnagiri District, Maharashtra, India. It uses logit and probit models to analyse the data. The results show a positive association between inward remittances and economic welfare and subsistence of the recipient households. Findings of the study show a strong negative relationship between the education of the household members and emigration.

Keywords Emigration · Remittances · Rural welfare · Subsistence

JEL Classification F22 · F24

1 Introduction

International remittances affect the recipient economy, both at the micro and macro-levels. The remittances can play a pivotal role in the development of the remote, rural regions. The present study draws attention toward international migration and receiving workers' remittances to examine their impact on the rural households of

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Ratnagiri, Maharashtra, India. The macro-level impact of remittances on the home country's macroeconomic economic indicators, like economic growth rate of gross domestic product (GDP), exchange rate stability, import and export deficit, etc., has been well documented (Mallick 2008; Ratha 2004; Ratha 2003; Chami et al. 2005; Nayyar 1994a, 1994b; Gupta 2005), while some studies suggest that remittances reduce poverty dynamics in recipient countries both in single and multiple country context (Adams 2004; Adams 2005; Adams & Page 2005; Muhammad & Ahmad 2009; Ahmed et al. 2010). International remittances coming from Indian diaspora residing outside the territorial boundaries have always been one of the major contributors to the current account balance (CAB) and supporting external trade position. According to a World Bank, Migration and Development Brief 37[1] (World Bank 2022), India received remittances to the tune of $100 billion which is the highest among all the recipient countries. In a recent globalised scenario (World Bank 2021; RBI 2022) during the COVID-19 pandemic, remittances have proved to be resilient in some of the countries with India being one among them, with a marginal drop of 0.2%. In India, Kerala receives the maximum share of inward remittances, which has resulted in higher per capita income and has also dramatically altered the consumption patterns of the state (Zachariah & Rajan 2012; Sasikumar & Hussain 2007; Kannan & Hari 2002). Per capita consumption expenditure is highest in Kerala among all other Indian states since the 1980s. All the aforementioned facts have earned the state an alternative name as the remittance state (Zachariah & Rajan 2012, 2007). The overall economic impact of remittance on the state of Kerala has driven the study to inquire about such micro-level impacts in the state of Maharashtra which is second largest remittance receiving state (RBI 2018).

There is great wealth of literature available on the socio-economic impact of remittances on household, the current status of the emigrants, and community development. These micro-level studies analyse valuable information from specific local samples at village, town, or block levels. Studies such as (Kannan & Hari 2002; Rajan et al. 2015; Parida et al. 2015) have documented the impact and role of remittances in the performance of the regional indicators and development of village economy. These studies help to understand the effects of remittances on the sample households which mitigate the economic subsistence. According to Taylor (1999), the choice of emigration might be a self-decision taken by the individual members, but other household features like the number of members in the household, and socio-economic conditions also play an essential role in the decision-making of the out-migrants. Extensive studies have been undertaken to understand the impact of remittances for the states of Kerala, Punjab, Goa, Gujarat, Andhra Pradesh, and Bihar by (Zachariah et al. 2002; Kaur 2018; Kapuria 2018; Guha 2013; Guha & Biplab 2013; Economic Times Paper 2014; Guha 2011; Sasikumar & Hussain 2007; Mohanty et al. 2014; Dey 2015; Chintamani 2017).

The current studies (Chakraborty et al. 2022; Rahaman et al. 2021; World Bank 2021; Irudaya Rajan et al. 2020; Jolad et al. 2020) altogether affirm that an

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[1] India received remittances to the tune of $81 billion as per Migration and Development Brief 31 (World Bank 2019) https://www.knomad.org/publication/migration-and-development-brief-31.

unprecedented humanitarian crisis due to the COVID-19 pandemic has raised considerable concern among emigrant and migrant families. Besides, it perpetuated and broadly inferred a serious impact of COVID-19 on the cross-border migrants' households in rural and urban areas all over the country. Turning to the consideration of the COVID-19 pandemic, we have thoroughly believed that it had placed two things at the bottom of the migrant society. Firstly, with the view of the individual migrant, it persistently brought unambiguous problems of pay cuts, job loss, restricted mobility, physiological distress, riskier accommodation, physical and financial constraint, social security-related issues, poor health treatment, and in some cases no healthcare services or high cost of health facilities at their work environment. Secondly, in the case of migrant households, it became a cause of sudden loss of expatriate income, financial concern, the anxiety of spreading COVID-19 viruses, ration shortage, poor livelihood, reduction in conspicuous consumption, concern about domestic chores management, restricted mobility and services which raise social cause and fear. This boosted poverty conditions and unemployment syndrome in every corner of the labour markets to the migrant society. In this regard, contract workers like unskilled and semi-skilled were significantly pushed out of the job markets. In addition, the livelihood portfolio theory adopted by Rajan et al. (2020) concludes that the COVID-19 pandemic has mostly impacted international migrants as compared to domestic migrants and their households. It also suggests uncertain future prospects for migrants due to limited research on restricted mobility in the present labour markets. Therefore, India has been adversely impacted during COVID-19 pandemic period. According to Abella and Sashikumar (2020), a large portion of the Indian emigrants to Gulf Cooperation Council (GCC) corridor play a vital role in the remittance basket of India. Ministry of External Affairs in their latest brief suggest that around 6 lakh Indians returned to their home country during the pandemic and most of them are from GCC corridor. Thus, it is important to note that India and GCC constitute a very strong economic integration and the present study includes samples of the emigrants from the GCC corridor. Though the study does not focus only on the consequences of the pandemic, it has altered the determinants of migration and receipt of remittances. These are nothing but two sides of the same coin that reveal inexplicable instants of migration movements and their level of subsistence in the sample households.

Maharashtra, despite being the second in the list of top remittance recipient state in India (RBI 2018), no studies exist which depict the impact of remittances in rural areas of Maharashtra. Therefore, the present study aims to address this gap in literature by examining the impact of international remittances in the rural Maharashtra to receive the highest amount of remittances next only to Kerala (RBI 2018). Thus, a field survey was conducted to collect the primary data which evaluates the impact of international remittances in the rural areas of the Konkan region of Maharashtra.

1.1 Objectives of the study

1. To study the relative importance of the factors influencing the incidence of emigration.

2. To study the relative importance of the factors influencing the size of remittances.
3. To study the effects of remittances on the household subsistence expenditure.

The paper is organised in five sections. Section 1 introduces the literature and objectives of the study. Section 2 describes the socioeconomic profile of the region of Ratnagiri with reference to out-migration. Section 3 discusses methodology for data collection. Section 4 presents the detailed methodology and observations from the analysis of the primary data. Section 5 concludes with the policy recommendations.

2 Socioeconomic Context

The industrially advanced state of Maharashtra has always played an important role in receiving inward remittances both at domestic and international levels. People from several states of India have always preferred the state of Maharashtra for domestic migration, as there is a better scope of opportunities available in education and employment conditions when compared with the rest of India. However, the regional imbalances within the state are evident from the emigration of labourers from the economically less developed region of Konkan. Ratnagiri is located in the central part of the Konkan region. The villages in Ratnagiri follow a similar pattern of out-migrants as observed internationally and as a geographical region for receiving remittances as compared to other respective villages across the states of India (Adiga 2008; Tumbe 2018; Vartak et al. 2019). Thus, such finding highlights the prominence of the district of Ratnagiri in the presence of international remittances recipient district catalogues.

The district of Ratnagiri in Konkan region witnessed a dramatic decline of 4.8% in census surveys conducted in 2011, when compared with that of the 2001 census survey (Census 2011; Tumbe 2015). One of the foremost important reason which could be attributed to this decline is the preference for out-migration taking place in the city like Mumbai (Bombay) and Gulf countries, etc. (Yamin 1991). Although agriculture (growing paddy and nachanee) and fishing (*Mmacchi*) are the principal occupation for the Konkan residents, it is also famous for cultivation of Alphonso (mangoes), coconut (*nariyal*) and betel nut (*supari*), etc (Padki 1963). Ratnagiri district is situated beside the Arabian Sea. According to the Economic Survey of India (2017–18),[2] a low level of agriculture productivity could be the main reason for the individuals from this district to out-migrate both domestically and internationally.

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[2] Chapter 12 of Economic Survey 2017–18 first time revealed the prospect of migration in India. It suggests that "Migration is a phenomenon that has structural transformation in economies and has paved the way for release of "surplus labour" from relatively low-productive agricultural activities to sectors enjoying higher productivity". Our study finds increases in remittance to the sample household spending in the receiving regions.

3 Data Collection and Methodology

The study draws its analysis from cross-border emigrant households in Ratnagiri district of Maharashtra in India. As mentioned in the NSSO 64th round report 2007–08 (NSSO 2010), the district has substantially high proportion of out-migrants. The field survey done for the study is one of the first of its kind of such surveys for the district of Ratnagiri. The previous studies mentioned that migration has direct impact on people staying in rural area. Hence, this considers rural region of Maharashtra as the unit of analysis, where people belonging to the religion of Islam represent higher number of international migrants.

A pilot study was conducted where all Block Development Officer (BDO), Panchayat Officers (PO), and Directorate of Economics and Statistics (DES) offices were visited for understanding the data sufficiency for the sample collection. As per the meetings and discussion with all block-level officers, some selected villages' names from requisite blocks were recorded and further diagnosed for data collection purposes. We used census 2011 enumeration data to randomly select blocks based on lottery method. From each selected block, five villages and within each village, 10 emigrants and non-emigrant sample households were randomly selected. The household level sample was determined using a listing matrix with specified conditions for the finalised sample unit. One adult person from each household was interviewed as a key informant with the help of a structured questionnaire.

To diagnose effects of remittance on the sample household, two types of the household have been surveyed, international remittance-receiving household (IREM) and non-receiving international remittance households (NIREM) using finite sample formula. Earlier research works have used this grouping of the households (Ali & Bhagat 2016; Mahapatro et al. 2017; Parida et al. 2015; Adams 2005). Initially, the sample size was 200 households. After cleaning data gaps both for IREM and NIREM households, the sample used for analysis was 180 households. The blocks from which the samples were collected are: Guhagar and Dapoli. Both the blocks have highest and lowest numbers of out-migrant villages profile in the district.[3]

4 Methodology

Model (I) estimates the relative importance of factors determining incidence of emigration. Model (II) estimates the relative importance of factors determining the size of remittances. Model (III) is used to estimate the effects of international remittances on the expenditure of the households. The following sections provide description of each of the models along with the empirical findings of the analysis (Table 1).

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[3] As per pilot survey discussion with BDO, Research and Statistical Officers among Panchayat Offices.

Table 1 Descriptions of the studied variables

Covariates	Definition of the variables
Household characteristics	
Hh_size	Household size
Hh_age	Age of the head of the sample households
Hh_edu	Education of the head of the sample households
Hh_gen_D	1 = if the head of the household is male 0 = if the head of the household is female
Hh_children	The number of children in the sample households under age 10
Hh_dependent	The number of dependent members in the sample households (non-working member including housewife–depend on income)
Mpce	Monthly per capita expenditure of the household
Family_type_D	1 = if the sample household belongs to the joint family system 0 = if the sample household does not belong to the joint family system
Human capital characteristics	
Mem_15_1	Number of member over age 15 with primary education
Mem_15_2	Number of member over age 15 with secondary education
Mem_15_3	Number of member over age 15 with higher secondary education
Mem_15_4	Number of member over age 15 with university education
Wealth characteristics	
Agriland_D	1 = if the household possess an agriculture land 0 = if the household doesn't possess an agriculture land
Non-agriland_D	1 = if the household possesses a non-agriculture land like buildup land, apartment, etc. 0 = if the household doesn't possess a non-agriculture land
Eco_obli_D	1 = if a household has any economic obligation like loans and advances etc. 0 = if a household doesn't have any economic obligation as mentioned above
Social characteristics	
Muslim_D	1 = if household belongs to the Muslim religion 0 = if household belongs to the other religion
Hindu_D	1 = if the household belongs to the Hindu religion 0 = if household belongs to the other religion
Open_D	1 = if the household belongs to the open category 0 = if household belongs to the other categories
Obc_D	1 = if the household belongs to the OBC category 0 = if household belongs to the other categories

4.1 Factors Determining Incidence of Emigration from Rural Maharashtra

The literature on migration theories reveals that out-migrant decision is based on household characteristics, human capital, and wealth characteristics (Adams 1993; Lanzona 1998). The literature reports that amount of total inward remittances received by the IREM household is different among the recipient households. Thus, in those cases using the total size of remittances could cause an error for analysis;

hence, we considered remittance-receiving household as a categorical variable, which is an alternative to the exact flow of remittances income (Taylor 1999; Adams 2005; Ratha 2003; Brown et al. 2013). Lucas & Stark (1985) discussed the same influential factor concept for out-migrant but replaced the total expenditure of the household instead of the international dummy category. The IREM and NIREM household characteristics are identical to distinguishing choice of out-migration and helpful in the use of categorical analysis. However, in the initial Model I, we have used logistic regression analysis for the sample household. The adaptation of logistic regression is when the dependent variable is limited (Madalla 1983).[4]

4.1.1 Model-I Specification

As explained above, the first strategy is to identify expected variables from the list of all variables with careful thought.[5] All expected variables resulted from logistic regression with their differences in statistical relations. But, sometimes the problem causes large estimated coefficient and standard error (Hosmer & Lemeshow, 2000). They also suggest to review the resulting variable critically and follow trial and error of modelling before concluding the final model. Hence, we have applied a participatory variable model approach, where some variables got excluded using univariate analysis techniques. Here, IREM (remittances) dummy is the dependent variable, and each independent variable was tested with regression analysis. Variable which has P-value < 0.25 was selected and adopted in the final logit model. However, those selected variables were found to be critical for study observation and statistically significant under univariate analysis tools, as shown in the final logit model for analysis. The methodology for analysing the logit regression model has been written in the general form by specifying the probability of out-migrant from recipient household as follows:

$$\text{Prob} \left(Y = \text{Emigrant} \right) = f \left[\text{HH}_{\text{ch}}, \text{HK}_{\text{ch}}, W_{\text{ch}}, S_{\text{ch}} \right] \tag{1}$$

where HH_{ch} is the household characteristics; HK_{ch} is the human capital characteristics; W_{ch} is the wealth characteristics; and S_{ch} is the social characteristics of the household.

In Eq. (1), the dependent variable is a categorical variable that takes on a value equal to 1 if the household has international migrant individuals (emigrant) and otherwise 0, which also means non-emigrant individual households (non-emigrant). The results of the predicted variables are explained in Table 2.

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[4] Madalla, G. S., Limited Dependent and Qualitative Variables in Econometrics, Cambridge Univ. Press, 1983.

[5] Literature and field observations suggested variables which would influence the probability of emigrant amongst sample households.

Table 2 Logistic regression to examine the factor influence for emigration

List of variables	Coefficient (β)	Wald statistics	Odds ratio (Exp β)
Household characteristics			
Hh_size	0.429 (0.540)	0.79	1.537
Hh_gen_D	− 3.035* (1.211)	− 2.51	0.048
Hh_age	0.217 (0.039)	0.54	1.021
Hh_edu	− 0.362** (0.181)	− 2.00	0.696
Hh_children	− 0.167 (0.599)	− 0.28	0.846
Hh_dependent	1.212* (0.472)	2.57	3.363
Mpce	0.003* (0.001)	3.91	1.003
Family_type_D	2.555** (1.314)	1.94	12.873
Human capital characteristics			
Mem_15 with primary education	− 1.605** (0.663)	− 2.42	0.201
Mem_15 with secondary education	− 2.511* (0.692)	− 3.63	0.081
Mem_15 with higher secondary education	− 2.437* (0.816)	− 2.99	0.087
Mem_15 with university education	− 2.282* (0.843)	− 2.71	0.102
Wealth characteristics			
Agriland_D	1.388 (0.901)	1.54	4.007
Non-agriland_D	− 4.059* (1.524)	− 2.66	0.017
Eco_obli_D	1.610*** (0.917)	1.76	5.006
Social characteristics			
Muslim_D	8.724* (2.889)	3.02	6151.648
Hindu_D	3.894*** (2.087)	1.87	49.115
Open_D	3.485** (1.688)	2.06	0.031
Obc_D	− 2.121 (1.642)	− 1.29	0.120
Constant	− 7.710** (3.419)	− 2.25	0.000

Number of obs = 180; Prob > Chi^2 = 0.000; pseudo-R^2 = 0.7781; LR Chi^2(19) = 194.09; Predicted = 95%; log-likelihood = − 27.67557

Significance level *$P < 0.01$, **$P < 0.05$, ***$P < 0.10$; parenthesis stands for standard error

Source: Primary Survey (2018–19); Author's calculation using Stata software version 15

Dependent variable: categorical variable emigrant (emigrant = 1 and non-emigrant = 0)

The statistical level of significance is based on the Wald statistic output. The Wald statistic revealed whether the coefficient (β) for that predictor is significantly different from zero. The formula of Wald statistics is [Wald statistic = β/S.E.]. If the p-value of the Wald statistic is less than 0.05, then that coefficient is statistically significant and different from zero (Field 2009, p. 287)

4.1.1.1 Model-I Formal Presentation

$$\text{Log}(Y) = \text{Log}\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k \qquad (2)$$

$P = 1$, if the sample household has an international migrant individual (emigrant).
$P = 0$, if the sample household does not have international migrant individual (non-emigrant). where $X_1 \ldots X_k$ is predictor variables that represent independent variables classified in four categories as mention in Eq. (1). P is the probability that

the event Y [emigrant households] occurs, $P(Y=1)$, which is range from 0 to 1. $\beta_0=$ is an intercept. $\beta_1=$ is coefficient. $P/(1-P)$ is the "odds ratio" which is range from 0 to ∞. Log $[P/(1-P)]$: log odds ratio, or "logit range from −∞ to +∞

The data have been estimated using the above equation by the maximum likelihood method with STATA version 15.0. The assumption of linearity and multicollinearity of continuous variables among all predictors was checked (Field 2009). Equation (1) is the logistic regression estimation equation, and the result has been described under four different heads of the independent variable, namely: (a) household characteristics, (b) human capital characteristics, (c) wealth characteristics, and (d) household social characteristics explanatory variables to explain their relationship. The detailed list of each category is listed in Table 1.

4.1.2 Model-I Empirical Observations

In Table 2, results indicate a negative coefficient and significant relation for gender and non-agricultural assets of the household. If a household head is female, open category suggests a positive and significant relationship for emigration (out-migration). The collected sample consists of the area where people are principally occupied in the agricultural sector; however, it is not necessary that every individual household possesses agriculture land of their own. Some of them worked as agricultural labourers possessing non-agricultural assets. The coefficient of the non-agricultural assets in the below regression equation table is negative, which implies an inverse relationship. Thus, having only agricultural land was found to be insignificant. The coefficient of economic obligation is found to be positively associated with the dependent variable. This indicates that the rise of economic obligations of the sample household inclined to increase their out-migrant (emigration) conditions.

The result suggests that if the education of the members' is over 15 years of age, they are less likely to emigrate (out-migrate). The result supports some previous studies (Zachariah et al. 2002; Zachariah & Rajan 2012) and contradicts with others (Dhak & Shah 2014; Adams & Page 2005; Yang 2008; Osili 2004; Ahmed et al. 2010) who find positive relation among education and migration. This is because those studies emphasised on highly skilled migrant settled in developed countries like the USA, the UK, Australia, etc. In the case of our sample which includes three types of occupation structure, they belong to transitory employment in foreign countries like Middle East.[6] Thus, it prevailed that households having education for less than 15 years possibly are more attracted to emigration (out-migrant). The probable explanation behind choosing either to migrate internationally with a low level of education is that they get a higher payoff and can opt for early settlement.

The following variables such as monthly per capita expenditure (MPCE), Muslim and OBC dummy, joint family households, and income-dependent members at the household have seen a positive and significant coefficient at 1% level of significance. This indicates that emigrants (out-migrants) is more likely to happen if the

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[6] Those sets are unskilled, semi-skilled, and skilled workers whose expertise mostly belongs to transitory workforce.

sample household possesses such listed characteristics as mentioned above and will lead to the successive event of emigration (out-migration) from the rural households of Maharashtra. The Muslim family has been dominant in the wave of international migration to the GCC countries for the last couple of decades (Gogate 1991). However, the dominance of the Muslim household in the sample study could be the reason that they have a highly significant coefficient 1% level of significance than the Hindu household coefficient 10% level of significance, which a general phenomenon in the villages is taken for the study. Internationally, the religious community Muslim represented 29% of their emigrant population out of a total out-migrants among the overseas population in India. An according to Census (2011), Muslims constitute 14.5% of their population in the country itself. However, today a fair amount of structural change has been observed, which concludes that households other than Muslim households might get attracted more in the same countries. Thus, the population of non-Muslims households share is expected to be a rise in the coming year in the Gulf region to look for early employment as per Pravasi Kaushal Vikas Yojana launched by the Government of India in 2017.

The coefficient under human capital characteristics exhibits negative and strong significant relationship, and the remaining three categories, namely household, social, and wealth, exhibit mixed (positive and negative relation) results. These findings are in line with the earlier studies of (Thorat and Jones 2011; Ahmed et al. 2010; Adams and Page 2005).

4.1.3 Predicted Probability

Furthermore, to understand the determinants which cause for emigration, we have calculated the predicted probability for the two select variables from the result, as given in Figures 1 and 2. The below figures are graphical representation of our result for the selected two variable which are consistent with our earlier results. Figure 1 explains that the probability of emigration increase with the rise in the number of income-dependent members in the households. Similarly, Figure 2 depicts a negative relationship between emigration and the number of years of schooling of the head of the households who are the main decision-maker.

4.2 Factors Influencing the Size of Remittances in the Sample Household

4.2.1 Model-II Specification

In order to understand the relationship between the size of international remittances and the household characteristics of the emigrant, the multiple regression analysis has been performed. According to Banerjee (1984), urban–rural remittances within India are determined by various characteristics such as yearly expenses of the household, the number of years completed by migrant abroad, age of migrants before migration, etc. Thus, this paper has adopted a (Sil 2011) model, for similar kind of study f to examine an association between the size of remittances and household characteristics and found some similarities, although we have estimated the
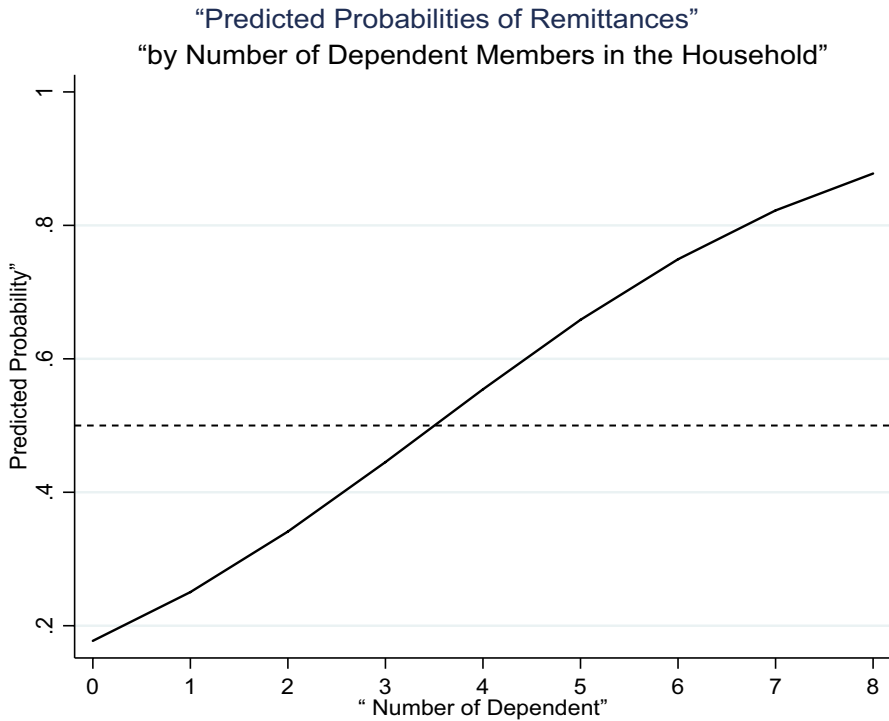
Fig. 1 Dependent members in the household

following regression equation where the dependent variable is the total size of remittances and different household characteristics as the set of independent variables.

$$y = \alpha + \beta\prime x + u \qquad (3)$$

where y is total size of remittance at the sample household and $\beta\prime$ is vector of all the explanatory variables related to the sample household and their migrant characteristics. Finally, u is the error term.

Model-II in detail

$$
\begin{aligned}
\text{Size\_remit} = \alpha &+ \beta_1 \text{Year\_exp} + \beta_2 \text{Year\_com} + \beta_3 \text{Year\_inc} \\
&+ \beta_4 \text{Age\_bef} + \beta_5 \text{Edu\_bef} + \beta_6 \text{Marri\_preD} + \beta_7 \text{Occu\_unskilD} \\
&+ \beta_8 \text{Num\_mig} + \beta_{10} \text{NonarilndD} + \beta_{11} \text{Mig\_resD} \\
&+ \beta_{12} \text{Dependent} + \beta_{13} \text{AgrilndD} + \beta_{14} \text{MusllimD} + u
\end{aligned}
$$

$$(4)$$

Table 3 depicts in detail for subsequent variables of Eq. (4). The multiple regression analysis has been executed to test the hypothesis that migrant households'
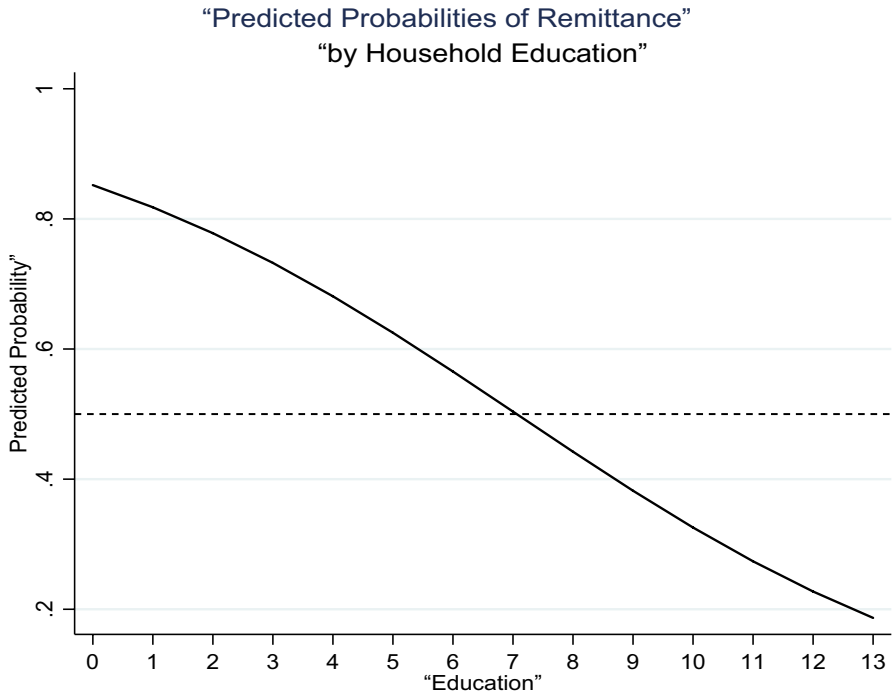
Fig. 2 Education of the head of the household. Author calculation from a primary survey (2018–19) Stata software version 15

characteristics do not affect at the remittance receiving household levels.[7] The output is broadly in line with the expected sign of the coefficients (Table 4).

4.2.2 Model-II Empirical Observations

Among all the independent variables, the results suggest that the total yearly expenditure of households, the number of years migrants have lived abroad, the age of the migrant before migration, and the number of emigrants in the family are statistically significant at 1% level of significance. On the other hand, the number of dependent members in the household and occupation of the migrant in the low-skill category are significant at 5% level of significance. This implies that more the burden of dependent family members on individual emigrant individuals, more will be a change of inward remittances. Similarly, the low skilled workers are keen to emigrate themselves as migration has proved to be more productive for them as far as their employment status is concerned.

Overall illustration (Table 4) suggests that the remittance amount is more helpful for recipient households across all the sampled households. The size of inward

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[7] We have tested multiple model, with the trial and omission final model produced in Table 4.

Table 3 Description of the variables

Variable	Definition of variables
Year_exp	Yearly expenses of the household in thousands of rupees
Year_com	Number of years migrant lived abroad so far
Year_inc	Yearly income of the household without remittance in thousands of rupees
Age_bef	Age of the emigrant before migration
Edu_bef	Number of years of schooling completed by the migrant
Mari_pre_D	1 = if migrant is married 0 = if migrant is unmarried
Occu_unskill_D	1 = if the occupation of the migrant belongs to skilled categories 0 = if the occupation of the migrant belongs to unskilled categories
Num_mig_D	1 = if migrant in the household is more than 1 0 = if migrant in the household at least 1
Eco_obli_D	1 = if a household has any economic obligation like loans and advances etc. 0 = if a household doesn't have any economic obligation
Non-agriland-D	1 = If household possess non-agriculture assets like apartments and others 0 = If a household doesn't possess non-agriculture assets
Mig_res_D	1 = if a migrant has only financial and family constrain reason 0 = if a migrant has any other reasons than financial and family constrain
Dependent	Number of income-dependent members in the household
Agriland_D	Possess agriculture land by the household 1 = If household possess agriculture land 0 = if a household doesn't possess agriculture land
Muslim_D	1 = If the household belongs to the Muslim community 0 = If the household belongs to other community

remittances is inversely related to economic conditions, in particular with the income parameter of the households (without remittance). Age of the individual before migration is drawn special attention because the present status of the mean age of migrants is 39 years old, and before migration, it was 29 years old among all emigrants in the sample household. Results indicate that the size of inward remittances negatively associated with the age of the individual migrant. The unskilled dummy has an expected positive sign of the coefficient and is also statistically significant at a 5% level of significance. The number of migrants in a given sample household exhibits a positive relationship with the size of inward remittances, which is highly statistically significant and very easy to understand. Thus, an increasing number of individual emigrants are inclined to raise the level of inward remittances.

4.3 Effect of Remittances on Household Subsistence Expenditure

4.3.1 Methodology

Existing literature has used different ways of analysis to highlight the role of remittances in the upliftment of the recipient households. To examine the contribution

Table 4 Factor Influencing the Size of Remittances

List of variables	Coefficient (β)	t
Year_exp	0.657* (0.0981)	6.70
Year_com	3.914* (1.1535)	3.39
Year_inc	− 0.198*** (0.1122)	− 1.77
Age_bf	2.562* (0.9616)	2.66
Edu_bf	− 2.350 (2.9580)	− 0.79
Mari_pre_D	− 25.451 (19.1997)	− 1.33
Occu_unskill_D	35.761** (14.5917)	2.45
Num_mig_D	74.695* (25.8694)	2.89
Eco_obli_D	− 9.807 (13.7158)	− 0.72
Non-agriland_D	− 4.788 (14.8699)	− 0.32
Mig_res_D	− 14.340 (12.9642)	− 1.11
Depen	8.276** (4.0317)	2.05
Agriland_D	− 18.657 (14.0201)	− 1.33
Muslim_D	26.748*** (15.7730)	1.70
_cons	5.179 (51.5286)	0.10

Number of obs $= 88$; F(14, 73) $= 13.46$; $R^2 = 0.7208$; Adj $R^2 = 0.6682$; Prob $> F = 0.0000$

Significant level *$P < 0.01$, **$P < 0.05$, ***$P < 0.10$, parenthesis stands for standard error

Source: Primary Survey (2018–19); dependent variable is remittance size

of inward remittances on the economic subsistence[8] of the sample household, we estimated the marginal effect of inward remittances on the household using probit model analysis, in model III. Table 5 summarises the probit model estimations using (methodology of 4.1.1). Thus, the study adopted a probit model estimation (Ahmed et al. 2010) and replicated the same as per the data available to validate in the use. It is also governed by inward remittances which trends to eradicate poor households whose economic needs (sample household) depend on inward remittances. We have performed the probit analyses; for the dependent variable it is IREM which is equal to "1" and otherwise NIREM as "0."

$$Y *= \log\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \tag{5}$$

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[8] As per earlier studies finding based on survey data, we considered remittance is helpful to improve basic level income satisfaction; which leads increase in household purchases among recipient households. To examine impact of remittances in the improvement in the income probit estimation analysis is preferable to measure probability of reduction income dependency of sample household when receive remittances.

Table 5 Probit regression for the test of the level of subsistence	Variables	Coefficient (β)	z
	MPCE reciprocal	− 5083.248* (998.136)	− 5.09
	Household size	− 0.099 (0.191)	− 0.52
	Household head education	− 0.202* (0.058)	− 3.47
	Household gender	− 0.117 (0.378)	− 0.31
	Member over age 15 male	− 1.109* (0.253)	− 4.38
	Member over age 15 female	− 0.455*** (0.266)	− 1.71
	Old depend	0.626** (0.297)	2.11
	Number of dependent	0.842* (0.186)	4.52
	Constant	4.317* (0.933)	4.63
	Marginal effect		
	MPCE reciprocal	− 2014.652* (394.510)	− 5.11
	Household size	− 0.039 (0.076)	− 0.52
	Household education	− 0.080* (0.023)	− 3.46
	Household gender	− 0.046 (0.150)	− 0.31
	Member over age 15 male	− 0.439* (0.101)	− 4.35
	Member over age 15 female	− 0.180*** (0.106)	− 1.70
	Old depend	0.248** (0.118)	2.10
	Number of dependent	0.334* (0.074)	4.54

Number of obs = 180; Prob > Chi^2 = 0.000; pseudo-R^2 = 0.6856; LR Chi^2(19) = 171.02; Predicted = 92.22%; log-likelihood = − 39.20975

Significance level *P < 0.01, **P < 0.05, ***P < 0.10; parenthesis stands for standard error

Source: Primary Survey (2018–2019); dependent variable: IREM = 1, otherwise (NIREM) = 0

$$Y * = \begin{cases} 1, & if \quad \text{HH has emmigrant memeber}(\textit{IREM}) \\ 0, & if \quad \text{otherwise}(\textit{NIREM}) \end{cases}$$

where $X_1\ldots\ldots X_k$ is predictor variables that represent independent variables. P is the probability that the event Y [emigrant households] occurs, P ($Y = 1$), which is ranged from 0 to 1. β_0 is an intercept. β_1 is coefficient. $P/(1 - P)$ is the "odds ratio" which is ranged from 0 to ∞. Log $[P/(1 - P)]$: log odds ratio, or "logit range from $-\infty$ to $+\infty$."

Model-III in detail

$$Y * = \log\left(\frac{P}{1 - P}\right) = \beta_0 + \beta_1 \text{MPCE resciprocal ear\_exp} + \beta_2 \text{Household Size}$$
$$+ \beta_3 \text{HH Head Education} + \beta_4 \text{Household gender}$$
$$+ \beta_5 \text{Member over age 15 male} + \beta_6 \text{Member over age 15 female}$$
$$+ \beta_7 \text{Old dependent} + \beta_8 \text{Number of dependent} + u$$

$$(6)$$

4.3.2 Model-II Empirical Findings

The result suggests that the variable of the number of year's education of the household head, number of male members over the age of 15 years, and reciprocal of monthly per capita expenditure (RMPCE) in the sample household has a negative and statistically significant at 1% level of significance. RMPCE is highly negative and matched with the adopted model of (Ahmed et al. 2010), which also indicates a decrease (or increase) in the reciprocal of MPCE that leads to a decline (or increase) the probability of subsistent based household. On the other hand, the number of income-dependent members on the migrants in sample households has a positive and significant at 1percetn level of significance. Further, the result concludes that the number of individuals under the category of students and older persons in the sample household is more likely to receive inward remittances. The increased working age group population (15–59 years of age) are more likely to receive inward remittances.[9] However, the size of household and gender of the head in sample households are seen to be insignificant.

4.4 Mean Income of the Households

Additionally, to understand the role of inward remittances on household subsistence expenditure, the paper has calculated the average income of the household putting three different categories for sample households. Afterward, we compared the effects of inward remittances on the per capita income of the emigrant and non-emigrant households, which are shown in Table 6. Economic subsistence is natural terminology among every household, but remittance recipient draws special attention to us as their average income including inward remittances is 116.4% higher than non-remittance (non-emigrant) household's income. The average income of the emigrant household with inward remittance is 111.7% higher than the same household income excluding inward remittances, although emigrant households' average income excluding inward remittances is 2.3% greater than non-emigrant (non-remittances) households.

Thus, the above analysis suggests that inward remittances play a major role in the emigrant as well as non-emigrant households if it receives. Specifically, add benefit for emigrant households as extra income, which changes the demand elasticity for goods and services in the recipient household. For example, it creates prerequisite demand for the product in rural villages and helpful for developing the rural economy. Inward remittance not only plays a crucial role in the income basket of recipient households but also elucidates ample effect in demand for the final product at the village market (demand side). The dominance of agriculture income in the study area could be the reason that non-emigrant households are sufficiently engaged and

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[9] Here, we has observed from the field that the students and old individual are alone not be effective to attract inward remittances but other factor might attract out-migrant to care with income outlook for household subsistence (basic requirement). These also true when predicted through modelling as general originality at the field.

Table 6 Comparison of the estimated mean income of the types of households

Types of households	Mean income monthly (₹)
A household with no migrant income	7844
A household with migrant (excluding inward remittance income)	8021
A household with migrant (including inward remittance income)	16,977
Change in the income (%Δ)	Percentage change in income (%)
%Δ in household with migrant include inward remittances over the household with no migrant income	116.4
%Δ in household with migrant include inward remittances over the household with migrant excluding inward remittances income	111.7
%Δ in household with migrant exclude inward remittances over the household with no migrant income	2.3

The income source is excluded agriculture income because of considered as annual income. Hence, it represents a lower-income figure for the total

Ahmed et al. 2010 represented these table for understanding differences in the household for their paper in the ABD working paper pp. 21. However, we prepared same table for our data as per required analysis

more attached to the home ground and never thought about emigration.[10] A business run by expatriate households are engaged with trading goods and services, tailoring, motor garage, and some woman have voluntarily joined self-help group (SHG). However, large-scale business has not been reported so far by the respondents as these businesses operate from taluka (urban city) place or metro cities, and women are not prompt to the response. Such cases are very few but significant.

5 Conclusion

India has been one of the major recipients of international remittances due to its vast population of emigrant workers. The study provides an insight into the factors determining emigration and the effects of remittances on villages in rural areas of Ratnagiri in Maharashtra. The primary survey of emigrant households has been carried out for the first time in Konkan region of Maharashtra. Selected block villages revealed that emigration has been dominated by Muslim households and highly significant association with emigrant and remittance flow, which was similar to previous study. Earlier, Ratnagiri District was used to be referred to as "money order

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[10] We have observed carefully while defined total income of the household. Having said that the source of income is limited in the case of emigrant household compared to non-emigrant household, because member engaged in the rural field jobs is comparably less in number among emigrant household compared to non-emigrant household.

economies district" in the Konkan division. The current study findings altered the determinants of migration and receipt of remittances that are nothing but two sides of the same coin and play important role for household's subsistence.

First, the study finds that household characteristics such as household education, gender, and children, number of dependent members are determinant factors for the expatriation. Further, it is observed that improvement in the level of education of a household member over age 15 years at a 1% level will probably reduce the burden of an expatriate by 0.10 percent. Down the line increase in Mean Per Capita Expenditure is more likely to happen if the household has emigrant members.

Second, it showed that the total size of remittances has a negative relationship with household income. A one percent decrease in income could cause more probability of receiving inward remittance. The findings confirm that remittance is helpful for household subsistence expenditure and has a substantial effect on reciprocal MPCE of the dependent member. Third, inward remittances are highly significant and positively associated with expenditure baskets of the households. Finally, the paper finds that remittance utilised more on health and education than consumption expenditure as stated by previous studies. In addition to that, study suggests that health expenditure has a crucial component compared to education expenditure among sample households. However, the finding of the study strongly coincides with the previous literature and highlights that the inward remittance mitigates the basic needs of the sample households. The effect of remittances has not been considered in the development policy for the local recipient areas. The study highlights that international remittances play an important role in development of rural areas not only through immediate effect on increase in expenditure but also through positive effect on long-term indicators like education levels in rural areas.

Declarations

Conflict of interest The author declares that they have no conflict of interest.

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